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THE STATE OF THE KNOWLEDGE ABOUT THE TEACHING OF VOCABULARY.

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RESEARCH ON THE TEACHING OF VOCABULARY WAS COLLECTED, AND THE VALIDITY OF SUCH INFORMATION WAS EXAMINED TO IDENTIFY SUCCESSFUL APPLICATIONS OF THE TEACHING OF VOCABULARY IN SCHOOLS. SOURCES BEARING ON THE SUBJECT OF THIS STUDY WERE INVESTIGATED IN DETAIL. THE INITIAL SURVEYING AND REPORT READING LED TO THE SECURING OF 80 STUDIES THAT WERE PARTICULARLY PERTINENT TO THIS PROJECT. THE SEARCH WAS LIMITED TO STUDIES DEALING DIRECTLY WITH PEDOGOGICAL METHOD, WITH THE TEACHING OF VOCABULARY AS OPPOSED TO THE ACQUIRING OF VOCABULARY BY NATIVE SPEAKERS OF THE LANGUAGE. THE REPORT ALSO INCLUDED DISCUSSIONS ON AN OVERVIEW OF VOCABULARY TEACHING, A REVIEW OF SELECTED STUDIES, LINGUISTIC CONSIDERATIONS, AND RESEARCH DESIGN. THE INVESTIGATORS RELUCTANTLY CONCLUDED FROM THE SOURCES REVIEWED THAT "THE TEACHING PROFESSION SEEMS TO KNOW LITTLE OF SUBSTANCE ABOUT THE TEACHING OF VOCABULARY." THEY CREDIT THE STUDIES WITH SHOWING THAT SOME TEACHING EFFORT CAUSES STUDENTS TO LEARN VOCABULARY MORE SUCCESSFULLY THAN DOES NO TEACHING EFFORT, BUT STATE THEY HAVE NOT DEMONSTRATED TO THE SATISFACTION OF THE INVESTIGATORS THAT ANY ONE PARTICULAR METHOD IS BETTER THAN ANY OTHER. IT WAS RECOMMENDED THAT FUTURE RESEARCH TAKE PSYCHOLINGUISTICS INTO ACCOUNT FOR RESEARCH CLUES IN THE STUDY OF METHODOLOGY. (AL)

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The State of the Knowledge About the Teaching
of Vocabulary

Project No. 3128
Contract OE-6-10-120

Walter T. Petty
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Earline Stoll

March, 1967

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Sacramento State College

Sacramento, California

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INTRODUCTION

This is the report of a study initiated by the Executive Committee of the National Council of Teachers of English in the spring of 1964 and directed at determining "The State of the Knowledge About the Teaching of Vocabulary." The study began with the appointment of Walter T. Petty, Professor of Education at Sacramento State College, as chairman of an ad hoc committee and director of the proposed study. A short time later other members of the committee were appointed and plans were made for conducting the study.

The action of the Executive Committee, in giving the impetus for this study, again reflects the concern of English teachers in general, as expressed through the National Council of Teachers of English as their representative body, with the general problem of what is known and what is not known about various aspects of the English Language Arts curriculum. The first expression of this concern resulted in a study of what is known about the teaching of composition--a study that has received wide acceptance by the profession.¹ The present report is the second effort directed at searching out in a professional manner the information upon which teaching procedures in English should be based. .

Objectives of the Study

The bibliography of vocabulary studies by Dale and Razik published in 1963, which lists 3,125 titles, is indicative of the tremendous interest in the study of vocabulary and its teaching and reflects rather specifically the amount of research directed at this interest.² A scanning of this bibliography, however, suggests further that there is great variation in approaches to the teaching of vocabulary. In addition, examination of some of the titles of these studies substantially adds to the general impression that little of a specific nature regarding vocabulary teaching has received wide-spread professional acceptance. The determination of the validity of this impression and the reason or reasons for it, then, was the principal objective of this study.

¹ Richard Braddock, Richard Lloyd-Jones, and Lowell Schoer, Research in Written Composition (Champaign, Illinois: National Council of Teachers in English, 1963), 142 pp.

² Edgar Dale and Taher Razik, Bibliography of Vocabulary Studies (Columbus, Ohio: Bureau of Educational Research and Service, The Ohio State University, 1963) (second revised edition, 257 pp.)

Specifically, the investigation reported here sought to identify what is claimed to be known about the teaching of vocabulary, to examine the validity of these claims, and to assess the information gained in terms of its application to the teaching of vocabulary in schools. A further objective, which developed largely as the study progressed and the paucity of valid knowledge regarding vocabulary teaching became increasingly evident, was the development of suggestions regarding linguistic and design considerations meriting attention for future research. A final objective was the determination and presentation of specific researchable problems in vocabulary teaching which appear to need attention.

Procedures of the Study

The investigative procedures for this study, from the time of the assignment of the topic by the Executive Committee of the National Council of Teachers of English and the appointment of the chairman of the ad hoc committee, were as follows:

1. The Executive Committee appointed the following as members of the committee: Edgar Dale, Professor of Education and Director of the Bureau of Educational Research and Service, Ohio State University; William D. Sheldon, Director of the Reading and Language Arts Center, Syracuse University; Bernard O'Donnell, Assistant Professor of English and Rhetoric, University of Iowa (at time of committee appointment, Assistant Professor of English, Ball State University); Lois Ruth Godwin, Associate Professor, Department of Secondary Education, University of Alberta; Curtis P. Herold, Associate Professor of English, and Earline Stoll, Assistant Professor of Education, both of Sacramento State College (Professor Stoll is now at the University of Southern California), who were also appointed as Associate Directors of the study. Ex-officio members of the committees were James R. Squire, Professor of English, University of Illinois, and Executive Secretary, National Council of Teachers of English; Richard Braddock, Chairman, Research Committee, National Council of Teachers of English and Professor of English and Rhetoric, University of Iowa; and Walter J. Moore, liaison officer to the Executive Committee, National Council of Teachers of English, and Professor of Elementary Education, University of Illinois.

2. A meeting of the ad hoc committee was held at the time of the National Council of Teachers of English meeting at Cleveland in November, 1964. This meeting, at which considerable time was spent in attempting to clarify issues and set limits to a study of the "State of the Knowledge About the Teaching of Vocabulary," resulted in minimal formation of specific plans but did include numerous suggestions to the

chairman, especially that financial assistance from the United States Office of Education be sought for the investigation.

3. Further planning of the study, including the writing of an application for a grant from the Cooperative Research Branch of the United States Office of Education was next done by the director, with the assistance of the committee and particularly Professor Squire. In addition, a letter, signed by the director and Mr. Squire, was sent to fifty-two professors on as many campuses in the United States and Canada asking for assistance with the investigation, specifically in the matter of locating studies dealing with the teaching of vocabulary. These requests provided the initial impetus to the actual investigation and the location of research related to it.

4. Approval of the application for a Cooperative Research Program grant was received in the summer of 1965; this grant allotted funds for a one-year period beginning September 1, 1965. The funds permitted the employment of a graduate assistant (Robert Mehaffey, who gave of his time and knowledge "far beyond the call of duty" and should be regarded as a principal investigator for the study), a half-time secretary (Mrs. Jean Schmidt, who also provided meritorious assistance), the release from a portion of their regular teaching duties of the director and the two associate directors, and the acquisition of research reports through interlibrary loan and microfilms. Subsequently these funds were supplemented by funds from Sacramento State College extending the financial support for graduate assistant aid and secretarial assistance.

5. In the fall of 1965 the following sources were searched for titles of studies which appeared to bear upon the subject of this investigation: Dissertation Abstracts; Psychological Abstracts; Mental Measurements Yearbooks; Child Development Abstracts; Speech Monographs; Education Index; Deafness, Speech, and Hearing Abstracts; Encyclopedia of Educational Research; and Bibliography of Vocabulary Studies. In addition, the titles of federally financed studies completed or in progress were also examined. From this searching, approximately 565 titles were identified as relating to the investigation. Abstracts of these studies or journal reports on them were read. In instances where no abstract or journal article was available, a faculty member on the campus where the study was performed was asked to briefly review it and recommend whether the study should be examined by the principal investigators. Further, the California State Library and the libraries at Stanford University and the University of California at Berkeley were visited and reports of studies examined.

6. In addition to the above described searching process, reports of studies possibly relating to this investigation were submitted by the members of the committee and by many of the fifty-two other professors who had been contacted by letter. These persons, and those who reported on specific studies when requested, are the following,

to whom appreciation is expressed:

Anthony Amato, Temple University
Daryl Basler, Central Washington State College
Louise Beltramo, University of Iowa
James I. Brown, University of Minnesota
John B. Carroll, Harvard University
Theodore Clymer, University of Minnesota
David C. David, University of Wisconsin
Delores Durkin, University of Illinois (then at
Columbia University)
Donald D. Durrell, Boston University
William Eller, State University of New York
Janet A. Emig, University of Chicago
John E. Erickson, University of Illinois
Eldonna L. Everetts, University of Illinois (then
at University of Nebraska)
Henry R. Fea, University of Washington
Morris Finder, Western Washington State College
Oscar M. Haugh, University of Kansas
Helen Huus, University of Pennsylvania
Mavis Martin, University of Southern California
Harold E. Mitzel, Pennsylvania State University
L. Edward Pratt, Southern Methodist University
Eugene H. Smith, University of Washington
George Spache, University of Florida
Ruth G. Strickland, Indiana University
Ingrid Strom, Indiana University
Bernice J. Wolfson, University of Wisconsin
Thurston Womack, San Francisco State College
Robert L. Wright, Michigan State University

7. The initial surveying and report reading led to the securing of eighty studies through interlibrary loan or the purchase of microfilms. These studies were all of those deemed by the reviewing process to be particularly pertinent to this investigation. They were read carefully and discussed in several sessions by the investigators and serve as the principal bases for this report.

8. An interim report on the progress of the study was prepared in January of 1966 and sent to the members of the National Committee for their review and suggestions. In April of 1966 an outline of the proposed report of the study was sent to the Committee for reactions. In addition, several members of the Committee were contacted

by the director of the study during the American Educational Research Association meeting in Chicago in February, 1966, for informal discussion of the problems and the progress of the study.

9. The summer of 1966 was spent by the principal investigators, assisted by Mr. Mahaffey, in rereading studies selected for reporting on in some detail and in writing this report.

10. After the completion of the draft of the report it was sent in the fall of 1966 to the members of the Committee for review and suggestions. Its form and content, however, are principally the responsibility of the director and the two associate directors of the study.

Limitations of the Study

From the beginning of the investigation, a major consideration was the problem of establishing limits as to precisely which areas of the total vocabulary development problem would be dealt with. The limitations of investigation finally established were those which appeared to the principal investigators, after the initial surveying and reading of studies, to be most realistically related to the time limitations and to the assignment from the National Council of Teachers of English. Specifically, the decision was made to focus upon studies concerned directly with pedagogical method, with the teaching of as opposed to the acquiring of vocabulary, and with the teaching of English vocabulary to native speakers of the language. The teaching of English as a foreign language was explored only peripherally, as was the teaching of vocabulary in foreign language instruction. Also not included in this investigation were many psychological and psycholinguistic studies dealing with vocabulary in which the application of the procedures and results to classroom teaching appeared to the investigators to be obscure. However, some reference to these latter studies is made in the report, with the implication intended that they do have considerable to offer but that the specific relationship of their contribution to vocabulary teaching needs clarifying.

A limitation to the report of any research is that which is inherent in the researchers themselves and in the availability of their sources of data. Other researchers might have attacked this problem differently, selected other data, or organized the report in a different fashion. This is recognized by the writers of this report and should also be recognized by its readers.

The Organization of the Remainder of This Report

Beyond this introductory section the report is organized into five chapters. These are as follows:

- II. An Overview of Vocabulary Teaching
- III. A Review of Selected Studies
- IV. Linguistic Considerations in Vocabulary Teaching and Research
- V. Research Design for Vocabulary Studies
- VI. Summary and Recommendations

While this study and this report are products of the combined efforts of the director and associate directors--assisted by Mr. Mehaffey--principal responsibilities for writing were assigned as follows: Professor Herold, Chapter IV; Professor Stoll, Chapter V; Professor Petty, Chapters I, II, and VI. Portions of Chapter III were written by each of the investigators and by Mr. Mehaffey.

II

AN OVERVIEW OF VOCABULARY TEACHING

The importance of vocabulary is daily demonstrated in schools and out. In the classroom, it is the achieving students who possess the most adequate vocabularies. Because of the verbal nature of most classroom activities, knowledge of words and ability to use language are essential to success in these activities. Adequacy of vocabulary is almost equally essential for vocational and societal achievement after schooling has ended. These are not simply the opinions of the writers of this report, they are truisms noted by even the casual investigator. Certainly, then, doing as much as possible toward the development of vocabularies having depth and breadth becomes a natural function of the school and those who teach.

A dictionary definition of vocabulary is usually "all the words of a language" or "all of those words used by a particular person, group of persons, etc." --or, often, "a list of words usually arranged alphabetically and defined." Thus, on the surface, it appears that the term vocabulary may roughly be equated with words and that vocabulary teaching means teaching words. The problem is not that simple, however, since sometimes a word is understood but not used. Sometimes a word may not actually be understood but may be used, and sometimes the idea or concept to which a word or words is applied may be known but the symbol neither known nor used; further, a word by itself may mean little or nothing and, of course, only one meaning of a word may be known or used. Vocabulary teaching, then, first must be concerned with the problem of deciding precisely what is to be taught.

The question of the role of teaching in the vocabulary learning process is also not subject to a simple answer. Just what teaching is means different things to different people. Rather typically, vocabulary teaching has meant attempting to have students learn new words and new meanings through responding to types of exercises of a generally formal nature, with, too frequently, not enough attention having been given to the reason or need for the teaching. As Watts has suggested, it is not the enlargement of vocabulary itself that is of value but the mind that needs enlargement.¹ On the other hand, a view of teaching as one of focusing less on direction and more on

¹ A. F. Watts, The Language and Mental Development of Children (Boston: D. C. Heath, 1947), p. 58.

the fostering of conditions may not make possible a greater number of opportunities for the enlargement of the mind.

The Acquiring of Vocabulary

The child forms his first words as he learns to differentiate among the sounds most common to his language. During an infant's babbling stage he is usually exposed to many of the phoneme combinations in his language by hearing them. While his babbling is random vocalization, it does serve as the basis for the beginning of imitative behavior. Thus, as the infant babbles, the sounds he produces become more and more similar to many of those produced by his parents and other persons in his environment. As these persons make reinforcement effort the probability of particular phonemes' recurrence is strengthened. Too, as this phoneme-reinforcement sequence occurs, a tendency develops for the sounds themselves to act as reinforcers, thus strengthening the response in the absence of any direct reaction from another human.

As the child acquires some of the phoneme combinations of his language, the process of associating certain of these combinations with visual stimuli begins. Discrimination on the part of the child is required since a particular visual or auditory stimulus must be attached to a specific phoneme combination. This discrimination is learned from the efforts of other humans who react to the child's verbalizing. As the infant says da da - he probably does so in response to no particular person as a stimulus and, in fact, likely does so simply because he has learned to put the particular phonemes together as a result of the babbling and reinforcement he has experienced. The reinforcement may be related not to persons directly but to sounds the infant has heard or to patting or some similar human contact. Later he may be stimulated to make this verbal response by seeing a person and, still later, only by seeing men, having learned to discriminate between men and women. Finally, of course, only one man becomes the stimulus. The acquisition of further vocabulary by the young child follows a similar pattern to this. The factors of imitation and reinforcement, and the learning of necessary discriminations, are all components of this pattern.

Vocabulary growth is very rapid during the preschool years, with such development providing the child with the symbols he needs to conceptualize and to make finer and finer discriminations in meaning. The extent of this development is dependent upon both the genetic and the environmental variables available. These variables affect the vocabulary growth of persons throughout their lives and, as is emphasized in later sections of this report, bear particularly

upon what may be done regarding the teaching of vocabulary. Every teacher attempting to provide greater breadth and depth to students' vocabularies must recognize and respect the development upon which he must build.

When the child enters school he has an extensive vocabulary. He understands a large number of words, although many of them are useless to him in the sense that he is able to use them in his speech. For many words he knows but a single meaning, with that meaning probably only vaguely held. One important task of the elementary teacher, then, is to improve the child's understanding of commonly used words, rather than to yield too strongly to the urge to present a stock of new ones.

The mind of the child entering school is remarkably receptive to word study, apparently retaining this facility for many years, but with a lessening of the rate of increase in vocabulary growth as he experiences traumatic developmental changes such as those related to puberty. Except at such times, the size of his vocabulary increases steadily at a remarkably rapid rate. Investigators are unable to agree on the years during which the major force of this increase occurs, but one investigator has found that the "absolute curve for vocabulary from seven through fifteen years is so steep that it resembles a straight line."² Other studies suggest that the development of an individual's vocabulary continues to increase at a rapid rate until age twenty or more; most investigators agree that the tendency is for this growth to slow significantly during the adult years. Some go even further and suggest that vocabulary acquisition virtually comes to a standstill at the end of the teenage years, and that a decrease in vocabulary size may accompany old age.

The Different Vocabularies

Little inquiry into the research in the field of vocabulary is required to discover that some investigators are reporting on something quite different from what others have written about, even though all rather positively assert that they are concerned with vocabulary. This further suggests the ambiguity of the word vocabulary and the problems encountered in dealing with it by research and teaching.

²Roy Miller Hamlin, "An Analysis of Growth Process Curves as Related to the Mental Growth Curve," Archives of Psychology, XLI (June, 1944), p. 27.

Some researchers have attempted to break vocabulary into groupings. The most common of these groupings is the separation into vocabularies of speaking, writing, listening, and reading. Deighton has suggested that "no two of them are identical. Each develops in its own way from a separate kind of experience, and each must therefore be studied and developed separately."³ The conclusion expressed in this statement seems unlikely, but there does appear to be easily verifiable evidence that a person may understand a word he hears and yet not use it in his writing or speaking. Too, he may read a word and be able to determine its meaning and yet not be able to do equally well with the same word in a listening situation.

Without becoming involved in the issues regarding the relative sizes of the different vocabularies, especially since the determination of vocabulary knowledge is itself a major problem (as is discussed later), there is reason to believe that recognition of a word and knowledge of its meaning may be learned for reading, for example,⁴ without its becoming what Gray labeled "permanent" vocabulary. Presumably a word is in the permanent vocabulary when it becomes known well enough to be used in both speaking and writing with sufficient cognizance of the major variations in meaning it may have.

Another categorization of vocabulary knowledge that is sometimes applied--and frequently as a "fifth" vocabulary-- is the "understanding" vocabulary. There are words that are known to the extent that a response can be made to them, usually, however, only in some particular context or with some "prompting" by the persons measuring the vocabulary or by an extension of the context. This type of vocabulary categorization may represent a particular level of vocabulary learning; in some instances it may be only surface learning and in others it may be that the word is in the "permanent" vocabulary but has not been used for such a period of time that instant recall might not occur.

Word Meaning and Concept Understanding

A concept has been defined as "a generalization about related data."⁵ The generalization may be a notion or a logically and thoughtfully developed principle, but it is essentially an idea, an

³ Lee C. Deighton, "Developing Vocabulary: Another Look at the Problem," English Journal (February, 1960), p. 82.

⁴ W. S. Gray, "Reading and Understanding," Elementary English (February, 1951), pp. 148-159.

⁵ David H. Russell, Children's Thinking (Boston: Ginn and Company, 1956), p. 68.

idea that may or may not be expressable by the holder through the use of words or other symbols, though usually it is not thought to be firmly held or actually grasped unless it can be expressed by some behavior. This behavioral expression need not be a linguistic one, however, as illustrated by the child who shows his understanding of the concept of roundness, his ability to generalize regarding it, by pointing to the wheel of his toy wagon, to a rubber ball, and to his cereal bowl; and, even more specifically, by his rolling of a marble but not attempting to roll his blocks.

Word meanings, of course, are closely related to concepts. The word round conveys a concept of roundness to the readers or hearers of it because of their experiences with both the concept and the word. The meaning of the word round, if it were unknown, could be taught to the holder of the concepts of roundness (to some extent, at least) since the teaching would be that of simple association of a symbol with a particular referent. However, for such a word as justice, while it represents a concept, the referent is less implicit. The concept of justice is emotive, usually much less tangible, much more dependent upon the circumstances, than is something like roundness. Justice is a complex concept referred to by the word justice, while the word round refers to a number of fundamentally related concepts, one of which is quite commonly known since it may be demonstrated simply. Thus teaching the word justice is usually more difficult than teaching the word round.

Reference to teaching the word round as in the above does not, as was suggested, recognize that this word also represents other concepts; for example, completeness as in a "round dozen," wholeness as in a "round number," approximateness as in a "round sum," singleness as in a "round of applause" or a "round of golf," and so forth (and a dictionary gives many more possibilities in considering round as an adjective, a noun, a preposition, an adverb, and both an intransitive and a transitive verb). While the concepts to which this single word is attached are in themselves different and may be equally or more strongly related to other words (e.g., "wholeness" to "undivided" or "approximateness" to "nearly"), they are kindred in the sense of returning to a starting point, making this kind of association of use in developing vocabularies.

It has generally been established that concepts develop gradually, with the sensory experiences of the infant as the first materials for concept building and logical, linguistic reasoning concerning a relationship between symbol and referent as perhaps at the other end of a continuum of development. Some concepts may

be well understood after only sensory experiences while others may not be understood without the linguistic knowledge, experiential background, and mental ability to reason both logically and with imagination.

Vocabulary knowledge as shown through understanding of the meaning of words and concept knowledge are not necessarily the same. Very young children particularly have conceptual knowledge they are unable to describe by using words or even to relate to words through recall. For example, again, the child may have considerable understanding of roundness and yet not be able to relate a circle on a test form to the word round, which he may "know" but only have experienced in "going round the block" or in merry-go-round. Children often use words even when they have no real understanding of the related concept. The distance between two cities is 430 miles; but how clear is the concept of a mile?

Despite these and other rather apparent exceptions, an individual is likely not to be able to successfully gain the meaning of a word without some understanding of the concept to which it relates; conversely, neither is it possible to successfully teach many concepts to children of school age without their having considerable functional knowledge of word meanings.

When Is A Word Known?

There exist numerous investigations, summarized by McCarthy⁶ and more recently listed by Dale and Razik,⁷ as to the number of words in the several "vocabularies" held to be possessed by persons of various ages. While these studies are tangential to the present study, the methodological difficulties which have plagued them are apparent in the reports of studies on the teaching of vocabulary. Too, the linguistic and methodological naivete shown in many of the quantitative studies is equaled in experiments directed at teaching vocabulary.

The most critical problem in measuring the dimension of a vocabulary, the extent of understanding of concepts, or simply the number of words "known" is that of surface verbalization--the manipulation of words without a real understanding of them. This is a difficulty that faces all teachers and confronts every textbook or test maker. Most persons quite frequently hear words or encounter

⁶Dorothea McCarthy, "Language Development in Children," pp. 492-630 in A Manual of Child Psychology, Leonard Carmichael, editor (New York: John Wiley & Sons, 1954) (second edition).

⁷Edgar Dale and Taher Razik, Bibliography of Vocabulary Studies (Columbus, Ohio: Bureau of Educational Research and Service, The Ohio State University, 1963) (second revised edition).

them in their reading and perhaps actually use them in speaking and writing without a genuine understanding of their meanings. This problem has been particularly recognized in reading authorities' concern with the vocabulary loads in textbooks used in the content areas of the curriculum, with excessive instruction in "sounding out" words, and with practices in general which result in verbalization rather than gaining meaning.

Measurements of the extent, precision, and depth of vocabularies rather generally require some type of verbal manipulation rather than providing for a true probing of the knowledge held of the multiple behavioral settings in which each word may be involved and including the almost indeterminate number of referents--the events, persons, ideas, and so forth--to which a word relates. Even the measurement of vocabulary in the sense of volume, the number of different words known, has typically required manipulation of words, language symbols, without an expression which genuinely gives assurance that the words are known to the extent that they are usable. The magnitude of children's and adults' vocabularies has been estimated in several ways. One has been the counting of the number of words used in the natural writing or speaking of a sampling of the population, as in the studies of Rinsland⁸ and Horn,⁹ a procedure more successful in gaining information on vocabulary size of written expression than of oral expression. A second has been the free-response method in which the individual writes or says any words which come to mind in a given time period.¹⁰ A third approach has been that of having individuals check words presented in some kind of context or list those that are not known, and from this estimating the extent of their vocabularies by reference to the total number of words in the source from which the sample was selected.¹¹ A fourth method has been one of attempting to determine the knowledge individuals hold, as measured by a recall or recognition technique, of a sampling of words from a dictionary and using this to estimate the total vocabulary size. The limitations of these procedures, all based upon a process of estimation rather than true measurement and faced with sampling difficulties, are discussed in a recent article by Lorge and Chall.¹²

⁸H. D. Rinsland, A Basic Vocabulary of Elementary School Children (New York: Macmillan Company, 1945).

⁹Ernest Horn, A Basic Writing Vocabulary, University of Iowa Monograph in Education No. 4 (University of Iowa, 1926).

¹⁰B. R. Buckingham and E. W. Dolch, A Combined Word List (Boston: Ginn and Company, 1936).

¹¹Edgar Dale, "Vocabulary Measurement: Techniques and Major Findings," Elementary English, December, 1965, pp. 895-901, 948.

¹²Irving Lorge and Jeanne Chall, "Estimating the Size of Vocabularies of Children and Adults: An Analysis of Methodological Issues," The Journal of Experimental Education, 32:147-157, Winter, 1963.

While the assessment of an individual's vocabulary knowledge might be attempted by any of the methods outlined above, usually such assessment is done by having him recall a word for a given meaning, recall a synonym or a meaning for a given word, match a word with a synonym or a definition, choose a word from several given and relate this to a specific definition or other word, or complete a sentence with a word recalled or selected from several options. As is immediately apparent, these procedures may all be questioned in respect to the validity with which they actually measure knowledge of a particular word. At best, knowledge of only one meaning of a word is usually measured by such recall and recognition techniques. At best, too, such techniques may be measuring the vocabulary available to the individual for reading (though the same could be determined for listening), with no assurance that the individual can use the words in expression. Even for the acts of reading and listening there is no complete assurance that the word will be recognized in a context different from that associated with it by the individual as he takes the test, even if the meaning in the new situation is the same as the one he associated with it on the test.

Dale has suggested that knowledge of a word can be placed on a continuum starting with "I never saw the word before" and progressing to "I know there is such a word but I don't know what it means," "I know generally how the word may be used," and "I know the word and can use it."¹³ Even with the continuum concept, however, a four-stage progression seems too limited; knowing a word and being able to use it usually does not mean knowing every possible meaning and being able to use it in all these contexts. Word meaning is a concept too elusive for simple defining.

Methods of Teaching Vocabulary

Vocabulary is gained from experiences an individual has; it is acquired by the association of these experiences with words. Stated with some oversimplification, the process involves sensory perception of an object or the attributes of an object, or perception of the relationships of objects with one another. Each new perception is added to earlier perceptions, the composite then being associated with the words whose meanings are already known or with new words spoken or written by another person.

¹³ Dale, op. cit.

For the most part, an individual's vocabulary has been acquired through the hearing of words and the fixing of meaning to them by other persons as they point to certain objects, give verbal explanations or descriptions, or show the relationships of the new words to words already known or to bits of knowledge already possessed by the individual. Probably, however, the process of imitation plays a larger role than does direct teaching, with the individual making his own associations between a word and the actions of the person he observes using it. After a person learns to read, his direct imitation of people decreases, though it does not cease, but the process of vocabulary building continues directly through his new experiences; vicariously through his reading and through exposure to such mass media as radio, television, and motion pictures; and surely through schooling where he is given deliberate instruction in new words and their meanings and in new meanings for words that he already knows to some extent.

The acquisition of vocabulary is a human process, depending significantly upon the level of intelligence of the individual and his environmental situation, a process that cannot be avoided under normal human conditions. Meaning will be attached to the elements of experience, in an accurate fashion or an inaccurate one, by every intelligent human being, with the ability to do this most accurately and to profit most from the experience consigned to the more intelligent.

In an analysis of the development of meaning for words, Dolch distinguished four separate processes:¹⁴ (1) expanding vocabulary through the adding of new words with perhaps only minor additions to meaning, such as synonyms (sketch for plan); (2) obtaining new meanings from old ones by learning finer distinctions of meaning (plan for a drawing or course of intended action that is detailed, and design for a drawing or course of intended action that is only sketched and conveying of an over-all idea); (3) undergoing new experiences (apparently direct ones) that yield new meanings; and (4) learning incidental vocabulary (from discussion and reading). In considering these processes, of course, one is immediately struck by several points. First, the processes would undoubtedly merge so that the individual acquiring meaning would be hard put to identify that he was adding a new word without much addition of meaning as opposed to undergoing a new experience which gave him a new word and its meaning. A teacher helping him develop vocabulary would

¹⁴ E. W. Dolch, "Vocabulary Development," Elementary English, January, 1953, pp. 70-75.

surely be equally pressed for the distinction. Second, all of the processes involve learning through experience--direct or vicarious; even the learning of a synonym is prompted by something. Third, the process of associating a word with meaning is a personal act that takes place in the individual's mind, generally not occurring in its entirety in one encounter, thus perhaps not deserving of this kind of categorization.

The teaching of vocabulary in schools has generally been done through (1) the teaching of words and their meanings through their use in the context of other words, (2) a process of word analysis and synthesis in which the meanings of word elements are taught, and (3) the direct teaching of the meanings from listings of words thought to be important.

Two other procedures for vocabulary building are often identified and very commonly used--in neither of which is teaching an important factor. One is the encouragement of wide reading. This procedure as a means of vocabulary building is closely related to teaching through context, but without the directness of instruction of true context teaching. Related to wide reading and to context teaching is a second common procedure, generally labeled "incidental teaching," which implies that some words incidentally encountered may be taught through the context of their use, through an analysis of their elements, or by direct study of their meanings after they have been selected.

The classifying of methods for teaching vocabulary has always represented a problem because of different interpretations given to such terms as "incidental," "context," "direct," et cetera, and because of the confusion among the meanings assigned to acquiring vocabulary, building vocabulary, and teaching vocabulary. Acquiring vocabulary is reasonably specific in that one person cannot acquire for another, though certainly another person may help him acquire. In considering teaching and building, however, the action of a teacher is less well defined. On the one hand, teaching may be regarded as specific and direct involvement of a teacher in helping to give meaning to words and, on the other, it may be regarded as the fostering of experiences which lead to vocabulary building. While the present investigators recognize the problem in defining terms, examination of studies and the reading of other literature led to the distinctions between teaching, building, and acquiring becoming reasonably clear. For the purpose of this report, then, it was agreed that the teaching of vocabulary would be regarded as a deliberate act beyond the kind of fostering of learning which should be a part of all teaching, and that this report should deal with the subject of instruction rather than the fostering of conditions

for building or acquiring (a subject of much greater scope).

The distinctions between direct, context, incidental, and several other terms regularly encountered as one peruses the literature on vocabulary teaching, however, are less clear. For example, is the teaching of the meanings of words in context direct teaching or not? Or is direct teaching limited to teaching meanings of selected words removed from any context? Should incidental teaching be regarded as the antithesis of direct, or should a distinction be made between indirect teaching and the lack of systematic attention implied in the term incidental? Are some methods structured so that they require deductive learning while others are essentially inductive in nature? Is the teaching of the meanings of roots and affixes direct instruction or incidental to the actual learning of vocabulary? These are some of the questions which must be answered as one attempts to classify methods by type. Classification, per se, is not central to the purpose of the present investigation, since knowing what actually may profitably be done to teach vocabulary is the essential information sought. However, considering the variations and elements of uniqueness in procedures advocated in the studies examined, some classification is required if generalizations are to be made as to the value of particular methods and techniques.

For the purpose of reporting on specific research on the teaching of vocabulary examined for this study, a particular classification was needed, as is made clear in Chapter III. For the purpose at this point in discussing the methods of vocabulary teaching currently being used, the various procedures are classified under the two general headings of direct and context methods. The following sections briefly define the principal techniques appropriate to each classification.

Direct Methods:

1. Word list. This procedure is listed first because it is the oldest of the direct methods. Its application in the classroom is simple, requiring only that the teacher assign at one time a given number of words to be learned and test this knowledge at a later time. The words assigned are generally selected from lists such as those by Thorndike and Lorge¹⁵ or Cole,¹⁶ are chosen from lists suggested in textbooks, or are chosen by the teacher from various subject areas of study. This technique is based on the assumption that the students study the words, generally by looking in a dictionary for their meanings and perhaps using them in sentences, and that the words will then become a part of their

¹⁵ E. L. Thorndike and I. Lorge, The Teacher's Word Bank of 30,000 Words (New York: Bureau of Publications, Teachers College, Columbia University, 1944).

¹⁶ Luella Cole, The Teacher's Handbook of Technical Vocabulary (New York: Rinehart, 1946).

active vocabularies.

2. Word parts. This method often includes not only the study of Greek and Latin prefixes, roots, and suffixes, particularly at the junior high school level and above, but also the study of English base words and common affixes. The procedure essentially requires the analysis of words, as directed by the teacher, the learning of some aspects of meaning in the elements, and the finding of other words--generally unknown--which contain one or more of the elements, thus giving clues to their meanings. The teacher using this technique is called upon to have an extensive knowledge of words and their composition and origins in order to effectively build interest and knowledge among the students. The procedure is based on the well-established fact that English does borrow heavily from other languages and that practice in analysis and synthesis will enable students to gain meaning from many unknown words without using a dictionary.

In addition to these methods there are variations of them which include direct dictionary study; the keeping of vocabulary notebooks; the systematic study of word origins; the study of synonyms, antonyms, and homonyms; and the use of word and language games, workbooks containing exercises such as the matching of a word with its definition, programmed teaching materials, and audio-visual materials. These activities and materials have in common the deliberate teaching of words and their meanings and, in general, the separation of them from context. Further these techniques involve concentrated word study, suggest testing at regular intervals, and offer almost instant feedback. Teachers employing these techniques are generally convinced that student vocabularies grow chiefly as a result of constant and deliberate attention on the part of both student and teacher.

Context Methods:

1. Context clues. This procedure is treated first because it may include elements of the direct method. This method is based on the belief that before students can gain meaning from unknown words met in context, the teacher must deliberately teach the clues that are available and how they may be employed. In application, however, the method is purely context and does not call for giving attention to study of words as long as meaning is secured from reading or listening, suggesting rather that meanings of unknown words will be gained much more rapidly in this fashion than by a direct method of study.

2. Incidental learning. This procedure, sometimes referred to as the context method, consists largely of "wide" reading, and suggests that vocabulary will develop without specific teacher attention as the students read. All teachers employ this technique to some extent, but some have greater confidence than others that students' vocabularies will develop as they repeatedly encounter the same words in their reading. The same kind of incidental learning, of course, can occur from listening as from reading.

As with direct methods, there are related practices and techniques which may generally be labeled context. These include, particularly, discussion by the teacher and students of connotation and denotation, idioms, multiple meanings, and word origins as the opportunity is presented in the context of classroom activities.

Classroom Practices in Teaching Vocabulary

While scholars and graduate students are turning out vast numbers of vocabulary studies, many of which purport to find a or the best method for teaching or otherwise developing vocabularies, classroom teachers, if they teach vocabulary at all, continue to teach meanings for words new to students in much the same way as they have for years, though the enterprising ones are prone to try many variations in basic procedures. As with much teaching practice and research, there tends to be too little communication between the researchers and the teachers. This is not to say, however, that classroom teachers are completely uninformed, or that they are using ineffective methods. In fact, it may well be that the researchers could take a few lessons from the teachers. For instance, many of the researchers considering vocabulary development pass over motivation without mention. No classroom teacher genuinely attempting to teach vocabulary makes that mistake.

As noted below, teachers reporting on favorite techniques begin with discussions of how student interest in word study was created. Most teachers doing such reporting take it for granted that other teachers know how to develop vocabulary, so essentially simply explain how they motivated their students.

The following examples, not presented in any judgmental sense as to their worth, give some insight into the great variety of classroom teachers' experimentation with vocabulary teaching and illustrate the attention given to motivation and creating interest.

1. One teacher abandoned the strict teaching of vocabulary and interested his English students by tracing a number of our most commonly used words from Old English usage.¹⁷ The students thought it fascinating to guess what an Old English word could mean today.

¹⁷ William Moir, "A World of Words." English Journal, March, 1953, pp. 153-155.

Later, attention was given to roots and affixes and the students were furnished with suitable reference materials for discovering the origins of words.

2. A second teacher reported that she found students most willing to study words encountered in reading if the reading material greatly interested them.¹⁸ After discovering the stronger interests of the students, she directed them individually to the subject matter they enjoyed and felt strongly about for their reading. From this reading, vocabulary was selected for teaching. This procedure, of course, would require some changes in curriculum prescription to accomodate the attention to interests; the extent of such change, however, was not reported.

3. One class visited newspaper offices and production facilities, which led to the students eagerly wanting to know the meanings of new words they heard.¹⁹ As the teacher of this class suggested, this technique need not be limited to newspaper office visits, but could be applied to any basically interesting and possible field trips. Of course, many elementary school teachers, particularly those teaching in the primary grades, have long recognized the value of real experiences in building understandings of words and concepts.

4. Another example of using extra-class activities to motivate learning the meanings of words was described by a teacher who arranged for trips to symphonies, plays, and concerts as a way to expand the school curriculum.²⁰ Her procedure prior to the event included the discussion of the event, using words the students did not know but which were important to a proper understanding of the event, and having the students look up the meanings of pertinent but unknown words. This teacher reported that, because of the interest in the event and the following discussion, the students were eager to discover the meanings of words they would otherwise have ignored completely.

¹⁸ Georgia E. Miller, "Vocabulary Building Through Extensive Reading" English Journal, October, 1941, pp. 664-666.

¹⁹ Frederic B. Baxter, "Vocabulary Development Through the Reading of the Daily Newspaper," English Journal, January, 1951, pp. 570-571

²⁰ Mabel Linder, "Vitalizing Vocabulary Study," English Journal, April, 1951, pp. 225-226.

5. Still another technique used for teaching vocabulary might be described as a modified association procedure.²¹ After placing posters around the classroom with a new word under each picture, this teacher found that her students displayed excellent abilities in recalling the meanings of new words by remembering what was portrayed in the picture associated with them and that they were interested in her extending this technique for many words.

6. A teacher who induced her senior English students to study words with increased interest by putting the word study in the form of a game recognized the importance of competition and doing things for fun.²² The students were anxious to learn word roots and affixes and other clues to meaning.

7. A procedure described by one teacher, and used by many teachers today, is that of capitalizing on the watching of television especially those programs of particular interest to the students.²³ This class discussed the many new words heard, and the teacher reported that students learned words rapidly when they appeared in the dialogue of favorite programs or advertisements.

The essential feature of these reports, and of many others which might have been included, is that they are based on the premise that students learn more if they are interested in what is being presented. Teachers in the elementary school have been generally more inclined to give attention to interests in learning than have secondary school teachers, possibly because of a greater emphasis upon the total development of the child as opposed to the pressures for teaching specific subject matter, possibly because it is more difficult to engage younger children in purely intellectual pursuits, and possibly also because of a greater resistance to such an approach by adolescents. Many elementary school teachers teach vocabulary through field trips, the following up of children's interests, unit teaching, and informal study of words. However, too often experiences are provided without adequate attention to new words or to new meanings for known words. The same is equally true for procedures which permit the fostering of individual interests, the development of a unit, and even the naturally arising discussion of new words and the ideas to which they relate.

²¹ Bernice Beggs, "Speak the Word Trippingly," English Journal, January, 1951, pp. 39-40.

²² Isabelle F. Swatts, "Seniors Will Play--With Words," English Journal, September, 1954, pp. 322-323.

²³ George Mason, "Children Learn Words from Commercial TV," Elementary School Journal, March, 1965, pp. 318-320.

In contrast to the approaches of teachers to vocabulary teaching, researchers have apparently assumed that interest in learning vocabulary is either automatically guaranteed or is an unimportant aspect of such study. Only one doctoral dissertation was discovered which sought to find the effect of interest upon learning vocabulary, though, of course, many others dealt with content which might naturally be expected to be of interest.²⁴ Regardless of the extent of inattention to interest in the learning of words, basic understanding of how people learn clearly shows that this facet must not be overlooked.

Vocabulary Teaching Suggested in Curriculum Guides

In an attempt to trace discrepancies between the central focus of teachers and that of researchers, numerous curriculum guides were examined. These guides specify that classroom teachers should make provision for vocabulary enlargement, although few describe methods to be used to accomplish this or mention how much improvement is expected. The guides that do offer suggestions on methods to be used differ widely. They also differ greatly as to suggestions for the amounts of time to be spent directly on developing vocabularies.

A California district's guide suggests that the teacher spend two periods a week for one semester each year on vocabulary study.²⁵ The guide specifically states that the sixth graders should spend about one-fourth of that time on Greek roots and three-fourths on Latin roots, except for one month devoted exclusively to prefixes and suffixes. In addition to the two periods per week, daily review is also prescribed. As to study procedures, the principal suggestion is that each student should keep a notebook.

In direct contrast is another recently published curriculum guide.²⁶ This guide begins the section on vocabulary with the title "Vocabulary Building Can Be Fun," and suggests that teachers increase student vocabularies by using all "direct" and "context" methods. A well-developed guide is offered to teachers in the Grosse Point, Michigan, Public School System.²⁷ This sixty-page guide is unique in that it reviews many advocated methods for improving student vocabularies and

²⁴Harriet O'Shea, "A Study of the Effect of the Interest of a Passage on Learning Vocabulary," (New York: Teachers College, Columbia University, 1930).

²⁵Language Development Guide, Grade Six, Downey Unified School District, 1964-65.

²⁶James M. Bailey, Improving Reading in Junior High School, Curriculum Bulletin 342 (Fort Worth, Texas: Fort Worth Public Schools, 1964).

²⁷Robert D. Welch, A Teacher's Guide to the Teaching of Reading (Vocabulary) in the Junior High School, The Grosse Pointe Public School System, (Grosse Pointe, Michigan: 1962).

discusses some of the research on the effectiveness of each. It suggests, further, how each method can be employed in the classroom.

In many other guides the vocabulary teaching advocated is primarily limited to learning the meanings of words in a list, the learning presumably to result from finding meanings in dictionaries.²⁸ Still other guides are available that vary in their concern with vocabulary development from no comment at all to the suggestions that "a maximum amount of time" be given to word study.

As a rule, curriculum guides reflect attention to the reports of research on vocabulary teaching, though this attention represents a good deal of superficiality in examination of the research itself, most suggestions being taken from books that discuss the teaching of English or from journal articles.

Vocabulary Teaching Practices in Colleges

Many colleges and universities seek to help students having poor grades to enlarge their vocabularies. Immediately noticeable, in even the limited examination of such attempts as was done for this study, is the major difference between the college professor's approach to vocabulary teaching and that of an elementary teacher, or even a high school teacher. While both the elementary and secondary teachers show considerable concern with motivation, college teachers are more inclined to take this for granted. One college professor who became interested in motivating university students to study vocabulary found that threatening them with tests was the best motivation.²⁹ Generally speaking, this is the technique for developing vocabulary most frequently accepted by the college professor, and, of course, it is essentially the principal motivator for other learning.

Other approaches have been used, however. For example, the University of Minnesota has had a course in recent years which seeks to improve the reading ability of students unable to produce suitable college level work.³⁰ Other colleges and universities have also instituted such courses. The Minnesota course is somewhat unique in that a program has been devised for vocabulary development and incorporated into the reading course without taking much of the available time.

²⁸ Elaine Stowe and Mabel Williams, A Guide for the Teaching of Reading in the Junior High School. Sacramento City Unified School District, (Sacramento, California; 1964).

²⁹ Walter Burchard Johns, "The Growth of Vocabulary Among University Students with Some Consideration of Methods of Fostering It," Journal of Experimental Education, September, 1939, pp. 89-102.

³⁰ Ernest Thompson, "The 'Master Word' Approach to Vocabulary Training," Journal of Developmental Reading, II, Autumn, 1958, pp. 62-66.

This program, called the "Master Words" approach, is built upon the supposition that sixty per cent of our language is derived from Greek and Latin. Essentially, the program calls for the teaching of a list of twenty prefixes and fourteen root elements which pertain to over 14,000 words in Webster's Collegiate Dictionary. Reports of results from this program suggest that vocabularies of students rapidly improved.

A course concerned strictly with vocabulary learning conducted at Colorado A & M has been reported as resulting in tremendous gains for students.³¹ Since the teaching is specifically directed at vocabulary growth, the intensive nature of such study would surely result in considerable vocabulary growth, especially since students would have enrolled voluntarily.

The reader should not infer from the limited discussion above that few colleges and universities give specific attention to student vocabularies, either in special courses or in the context of English and other courses. Neither is this discussion meant to imply that only word parts are taught as a means of developing vocabulary. It does appear to be true, on the other hand, that the number of words many students have available for use is limited and that too little attention is given to vocabulary development at this level.

³¹ Alfred Westfall, "Can College Students Expand Their Recognition Vocabularies?" School and Society, January 13, 1951, pp. 25-28.

III

A REVIEW OF SELECTED STUDIES

The purpose of the study upon which this report is based was to determine what the teaching profession knows about the teaching of vocabulary--implying, at least to the casual and uninitiated (which the present investigators will confess to have been), that there is some best way to teach vocabulary, that it generally is not well enough known, but that it should be rooted out for all to use. This simply is not the case.

The studies investigated show that vocabulary can be taught; they do not show that a "direct" method is better than an "indirect" one, that teaching words in isolation is better than teaching them in context, that an inductive approach is better than a deductive one. That is, it is not clear that these or any other dichotomies--other than that of teaching vocabulary versus not teaching it--have been resolved as a consequence of the designing, executing, and reporting of these many studies.

This is not to suggest that nothing is known about vocabulary teaching; some aspects of such teaching are known. Neither should one infer that all of the research has been of inferior quality or that it has not been directed at many of the specific vocabulary issues, though the quality and design of many studies may be challenged.

The studies selected for review and discussion are, in general, the better studies located in this investigation. However, the principal purpose for including these particular ones for discussion is not their quality but rather that they illustrate the approaches to vocabulary teaching that have been studied and that they serve well as vehicles for discussion of the particular problems encountered in this area of research.

Gray and Holmes

A major, and generally well designed study, now well over thirty years old but still quite pertinent to this investigation, was conducted by Gray and Holmes.¹ In the principal phase of this study, Gray and Holmes compared vocabulary growth resulting from "direct" and "incidental" teaching methods as used in the history classes of fourth grade pupils in the University of Chicago Laboratory Schools.

¹William S. Gray and Eleanor Holmes, The Development of Meaning Vocabularies in Reading (Chicago: The University of Chicago, Publications of the Laboratory Schools, Number 6, February, 1938) 140 pp.

Procedures followed in teaching by the direct method included:

- (1) Teacher guidance in helping pupils form clear, vivid associations between word meanings and their oral and written symbols. This was achieved by using illustrations, pictures, and other devices, by writing a new word on the board and directing attention to it as it was discussed, by pointing to the word any time it was said by the teacher or the pupils, and by treating each word as a whole rather than calling attention to any part of it.
- (2) Promotion of the habit of using the context in deriving the meanings of words and phrases by the writing of sentences on the board and the reading of these by pupils and teacher together, with the teacher showing how there often are clues within the context which give meaning to a word.
- (3) Provision of opportunity for pupils to use the new words appropriately in either oral or written form, with particular encouragement for them to do so, both informally in class discussion and in writing answers to study guidance questions.

The incidental method, as used by Gray and Holmes, essentially consisted of wide reading, with no particular teacher guidance in respect to gaining meanings of new words from the context and with no class activities focusing directly upon learning word meanings--perhaps suggesting something of an unnatural procedure (as is discussed below).

Twenty-one pupils were in the control group, which followed the incidental method, with twenty and eighteen pupils in the two experimental groups, both taught by the direct procedure. Pupils in the three groups had been administered the Stanford Revision of the Binet-Simon Intelligence Test, the vocabulary section of the Stanford Reading Examination, and one form of a specifically developed vocabulary test of words found in the two history units taught during the course of the experiment. An attempt made to equate the three groups by these measures was not successful (though the reason is not clear in the report), with the control group actually including pupils distributed somewhat evenly from the highest to the lowest on the specifically developed vocabulary test and with one experimental group including pupils of higher vocabulary achievement and the other pupils of lower achievement. For actual comparison, however, twenty individual pupils from the control group were rather closely matched, chiefly by scores on the special vocabulary test, with a like number of pupils from the experimental groups. In addition, the averages on the various measures for the control group were approximately equal to those of the combined experimental groups.

Factors controlled for the study were the teacher (the same teacher taught all three groups, working from common introductory remarks for units of study and mimeographed grade sheets), the teaching materials used (identical assigned reading, the same lists

for extensive reading, and common pictures and other elements of room environment), the "mind set" (the same general problems and questions for guidance of study), and the amount of time devoted to class instruction (one-half hour each day). The experimental groups, however, spent somewhat less time in supplemental reading than did the control group.

The experiment extended from October to December, 1932, when a second form of the specially constructed vocabulary test was given. During this time the pupils had studied two history units.

The testing showed that all of the pupils except two in the control group, gained in vocabulary knowledge; that pupils with the smallest initial vocabulary test scores made the greatest gains, with this being more noticeable in the experimental groups than in the control group; and that pupils with the lowest mental abilities made the greatest gains. Tables I and II show the gains for the paired pupils in the groups.

Testing vocabulary growth, as has been pointed out, is a difficult task. In this study the testing was done through use of the common multiple-choice, sentence completion form, with each word used in a sentence and calling for the pupil to choose one of four definitions for the word. The report of the study gave only one example of a test item, but to the extent that this was representative of the others, and considering the general shortcomings of such testing in measuring vocabulary, it appeared to be satisfactory in the judgment of the present investigators. However, considering limitations as to sentence length on a printed page and good test construction practices of making possible responses in a multiple choice test item of similar length in order to minimize the presenting of a clue to the correct response, there is cause to wonder about items for such words as incense, whorls, sinews, milling-stones, and drawbridge.

Too it is well to note at this point that no statistical tests were made of chance differences in results or of significant inequalities in the grouping or in the pairing of pupils. Further, the controlled teaching might well be considered as having been too closely controlled. It hardly seems likely that a teacher would present lessons containing such words as tapestries, villa, fibers, papyrus, and incense without discussing them with the pupils unless constrained by the researchers' directions, a constraint which would then surely have been felt by the pupils. The fact that pupil interest and query was soporific suggests the strong possibility that the teacher was teaching poorly with the control group but was imaginative and creative with the experimental groups. Other than these matters, which are significant but which were at least partially due to knowledge limitations at the time of the study, the present reviewers believe factors relevant to comparison were relatively well controlled and the experiment reasonably well designed.

TABLE I

GAIN IN SCORES OF PAIRED PUPILS IN THE CONTROL AND THE EXPERIMENTAL GROUPS ON THE EXPERIMENTAL VOCABULARY TEST FROM OCTOBER TO DECEMBER.

Paired pupils belonging to	Mean Scores on Experimental Vocabulary Test			
	October Test	December Test	Gain in Score	Percent of Gain
Control Group	65.2	74.1	8.9	13.6
Experimental Group	64.6	87.4	22.8	35.3

TABLE II

GAIN IN SCORES OF PUPILS IN THE UPPER AND LOWER HALVES OF THE PAIRED GROUPS ON THE EXPERIMENTAL VOCABULARY TEST FROM OCTOBER TO DECEMBER.

Paired pupils belonging to	Mean Scores on Experimental Vocabulary Test			
	October Test	December Test	Gain in Score	Percent of Gain
Upper half of Control Group	78.5	87.9	9.4	12.0
Experimental Group	77.3	93.1	15.8	20.4
Lower half of Control Group	52.0	60.4	8.4	16.1
Experimental Group	52.0	81.9	29.9	57.5

The vocabulary test constructed, and administered in both October and December, consisted of 100 words chosen as new from the units studied and divided into two fifty-word parts for purposes of correlation (a correlation of $.84 + .03$ was found by the Pearson product moment formula). Since this test included some words taught by the direct procedure to the experimental groups, the investigators studied the effects of this teaching upon the results secured from the testing. Table III shows the mean gains and the percentages of gain for the control group and two experimental groups; in List II were fifteen words taught to the experimental groups and incidentally made meaningful to the control group; and, in List III were twenty words not taught at all.

Significantly these data show a much greater gain for the experimental group when the words had been taught--a not unexpected result--with little difference between the means for the untaught (List III) words. Probably a statistical analysis would have shown the List III difference not significant. Since the experimental test was heavily weighted with words taught to the experimental group (List I), results favoring the experimental group become suspect.

However, the study apparently showed the value of direct teaching of vocabulary, though the "incidental method" could hardly be called a method. The actual results were that, within the limitations of the particular investigative situation, attention to vocabulary development produced gains not achieved when little or no attention was given; thus the results would seem to indicate that pupils will gain little meaning from encountering many words in reading unless they are guided in doing so.

The effects of the direct and indirect methods of vocabulary development on reading efficiency were also examined by Gray and Holmes. This phase of the total study relates to the present investigation only in that the greater reading efficiency shown by the pupils who had received direct vocabulary instruction provides another measure of the results of such teaching, one that perhaps is more meaningful and a truer measure than is that secured from the testing. According to Gray and Holmes, the direct vocabulary procedures resulted in greater accuracy in word recognition, more fluent and orderly habits of recognition in silent reading, more detailed and accurate comprehension, a clearer grasp of relationships between various elements of meaning, and a more orderly organization of the ideas secured through reading.

In a third phase of the study, attention was directed to the influence of context on specific word meanings. Two selections were chosen for this study, differing in that one presumably did not illuminate the meaning of an unknown word--although quotation marks

TABLE III

GAIN IN SCORES OF PAIRED PUPILS FROM OCTOBER TO DECEMBER
ON THREE LISTS OF WORDS SELECTED FROM THE
EXPERIMENTAL VOCABULARY TEST AND
TAUGHT BY DIFFERENT METHODS

Paired Pupils belonging to	Mean Scores on Words Selected From Experimental Vocabulary Test			
	October Test	December Test	Gain in Score	Percent in Gain
Control Group Experimental Group	List I			
	40.0	46.6	6.6	16.5
	39.0	57.5	18.5	47.9
	List II			
Control Group Experimental Group	11.9	13.2	1.3	10.0
	11.6	14.4	2.8	24.1
Control Group Experimental Group	List III			
	13.8	15.0	1.2	8.0
	14.3	15.6	1.3	9.1

called the reader's attention to it--while the other attempted to deliberately explain such words through the use of appositional definitions. From this phase the investigators concluded that developers of reading materials should plan for assisting in vocabulary development but that systematic teacher guidance and help is still needed. A noteworthy fault with some of the passages used for studying the influence of context on the learning of words is that they are so wretchedly written a pupil who would not be confused by them would be unusual. This is not to suggest, however, that even with well-written passages similar results would not have been obtained in most circumstances without specific direction by the teacher in how to elicit meanings from contextual clues.²

In the final portion of the study, Gray and Holmes noted problems encountered in teaching meanings and outlined the methods used. These include pronouncing a word and looking at it closely; looking at pictures, sketches, etc. which help to develop meaning; discussing possible synonyms; noting present and past tense through using the word in several sentences. They further pointed out the necessity of paying attention to pronouns and to what they called adverbs of relationship (therefore, here, later, consequently, etc.), a need they did not seem to pay controlled or testable attention to in their experiment.

Mattola

A study now fifteen years old sought to settle the question of the effectiveness of teaching words in isolation as opposed to the effectiveness of teaching them in phrases.³

For this study, ten first grade classes from a medium-sized Eastern city were used, with complete scores available on 279 children and with all of the children having had previous school experience. The experiment was conducted during the first six weeks of a fall semester with all classes daily devoting a ten-minute period to teaching and another ten minutes to related games which provided practice on the words and phrases in the day's lesson. The exercises, constructed by Mattola, were based on vocabulary from the reading

²An interesting study on the kinds of problems children have in deriving meanings from sentences is one by Heinz Werner and Edith Kaplan, "Development of Word Meaning Through Verbal Context: An Experimental Study," *Journal of Psychology*, 29-30 (1950), 251-57.

³Margaret D. Mattola, "The Effect of Teaching Reading Vocabulary by Words in Isolation and Phrases in the First Grade," unpublished Doctoral Dissertation, School of Education, Boston University, 1951.

texts. We Look and See, We Work and Play, We Come and Go, and Fun With Dick and Jane.

On the first and second days of the semester the children were given the Murphy-Durrell Reading Test and the Learning Rate Test, with three levels for reading being established for each class on the basis of the Learning Rate Test. Each child was also tested by a flash card test to determine his initial knowledge of the words to be taught during the first three weeks, with a similar testing subsequently before the final three weeks. Three sets of exercises for differing ability levels were prepared for each of the two teaching methods, with five teachers teaching words in isolation the first three weeks and words in phrases the second three weeks and five other teachers reversing this procedure.

The words taught were presented to the isolation group on flash cards, one word on each, and to the phrase group on similar cards but with the words in phrases. For example, on the first day the top group was shown five cards, each containing one of the words Dick, look, oh, Jane, and see and the top phrase group was shown cards each containing one of the phrases Look, Dick; oh, oh, Dick; Dick, look; Look, Jane; and See, see. The top groups continued to be shown five words or phrases each day of the experiment; the middle groups three new words or phrases, and the low groups one new word or phrase. Each day's lesson plan included a written exercise for practice on the day's words or phrases, a game, and an enrichment exercise designed to provide meaning for the words or phrases.

At the end of the first three weeks Form A of the Detroit Word Recognition Test, an oral reading test, and a flash card test were given to the groups. At the end of the second three week period Form B of the Detroit Word Recognition Test was used along with a second series of flash cards and a second oral reading test. The results were analyzed by testing the significance of difference between means for the isolation groups and those for the phrase groups.

Differences between the two methods studied were consistently in favor of words taught in isolation. For the total population there were significant differences in favor of teaching words in isolation from each of the two testings on both the oral reading and flash card tests. However, the difference in the means of the scores on the two Detroit Word Recognition Test forms was not significant, at the end of either the three weeks or the six weeks. Mattola pointed out the lack of significant overlap between words taught in the experiment and those on the Detroit Word Recognition Test.

The study was designed to control the teacher bias, the word difficulty, and the individual differences among children by rotating methods. Although Mattola briefly describes the population sample and states that the children were administered the California Test of Mental Maturity with a resulting mean mental age slightly above the average chronological age, she fails to indicate how the ten first grades were chosen. She did find that for the fifty-two children with I.Q.'s below ninety the difference on the oral reading test, although in favor of words taught in isolation, was not significant at the .05 level. One might also question whether or not three weeks in the first two months of the first grade is a sufficient length of time to test a method and wonder if the results would have been the same had the methods been tried for an entire semester.

A very strong point in the report of the study is the inclusion of the lesson plans and other materials used. The plans followed the reading texts closely--considering the content of the texts, perhaps too closely to actually measure the relative effectiveness of these two methods for teaching new words. As is dealt with later in the present report, the oh, Jane kind of phrasing does not represent natural speech and is beyond the common usage of the pupils. Such phrases require the pupil to take account of peculiar pitch and juncture elements he probably should not have to deal with explicitly at the beginning first grade level. In other words, the phrases used were really composites of isolated words rather than true phrases. Too, since the children were acquiring a sight vocabulary with little auxiliary word help, the question is posed as to whether the results would hold had the phrases contained two or more familiar words as the new word was included. Certainly it appears that different results might have been obtained if, for the second three week period, especially, the new words had been introduced only in context with words already known. Presenting a phrase with possibly two or more unknown words strikes the present investigators as introducing an interference pattern, particularly in situations demanding recognition of one of the words in combination with words other than those from the teaching phrase.

The tests did not appear to measure comprehension although one variable listed as being evaluated was reading achievement. Too, the "enrichment" exercises listed with the lesson plans did not define the specific words in the phrases but gave only meanings for the total phrases, many of which did not appear in the stories used for the oral test. For example, the phrase enrichment exercise for lesson one for the top group explains the phrase "Look, Dick" as

"They mean for Dick or Jane to look at something." On the other hand, lesson one for the top group studying words in isolation has the two words explained as follows: "Dick--Dick is a boy's name;" "Look--It means to look at something or call attention to something."

Possibly due to time limitations, Mattola failed to devise a "combination" approach for comparison with the isolation and phrase approaches. For example, such an approach or method might have first consisted of teaching isolated words, then putting these and the new words in larger and larger contexts. Since ultimately a pupil must connect word elements in larger structures, cat and ran may ultimately become cat ran and black and cat may ultimately become black cat; the opportunity was present to put them together (even when dealing with Dick, look, see and Jane, as Dick and Jane, look at Dick, et cetera).

A related problem, which possibly could better apply at a later stage in children's development, of course, but which might have been investigated, is whether certain words rather than all words should be taught as isolates or in combinations. For example, might such phrases as dark night, soft pillow, and down town be taught in combinations, or should the words be taught singly?

Otterman

In this study the experimenter used twenty seventh grade classes, ten as the experimental group and ten as the control group. Initially there were 585 pupils, 293 in the experimental group and 292 in the control. Various factors of classification (the Otis Quick Scoring Mental Ability Test, Beta; average reading score in Gates Reading Survey for Grades 3 to 10; a specially devised vocabulary test; and a specially devised spelling test) and irregularities in attendance reduced to 440 the number of pupils evaluated and all the statistical tabulations were based on this latter number. The experiment was of six weeks' duration, preceded and followed by tests designed to determine gains (1) in ability to interpret new words containing the studied elements, (2) in incidental learning of spelling, (3) in speed of visual and auditory perception, (4) in general vocabulary, (5) in reading comprehension, and (6) in speed of reading. There was also a test administered six weeks after the conclusion of the experiment to test the pupil's recall of the items taught.⁴

⁴Lois M. Otterman, "An Experimental Study of the Value of Certain Word-Roots and Prefixes to Seventh Grade Pupils," unpublished doctoral dissertation, Boston University School of Education, 1952.

The teaching method used with the experimental group was as follows: Thirty lessons of ten minutes' duration each were composed, each lesson based on one prefix or one word-root, with only one day spent on each lesson although review words were scattered throughout the lessons. Further, a review was given after every fifth lesson. The teacher presented the initial word, and with the help of the pupils arrived at the meaning of this word from the known element and the meaning of the new element studied. The pupils copied the element in their notebooks, using one page for each root or prefix.

The conclusions derivable from the statistical data were essentially negative. Only pupils with high mental ages in the experimental group made a statistically significant gain in the interpretation of new words and there were no significant gains by the experimental group over the control group in general vocabulary, in reading comprehension, or in speed of reading. More positively, the experimental group was significantly superior to the control group in spelling, with the low initial scorers and the boys making the more significant progress, and the test on delayed (six weeks) recall of prefixes and word-root meanings showed the experimental group significantly superior to the control group. The total experimental group showed no superiority in improvement in speed of visual and auditory perception, but the low mental age pupils in the experimental group did show significant gains over those in the control group.

Insofar as the testing devices themselves are reliable (and they would seem to be generally so), the conclusions of the study appear to be valid. This suggests that at least this particular method of teaching vocabulary through word-parts is not satisfactory, and it seems probable that similar programs of word-study are not likely to show strikingly positive results. The method does seem to hold promise for spelling and perhaps more limitedly for the teaching of slower children.

Some matters not considered in the study that perhaps should have been, and certainly could have been, are whether or not there was any greater enthusiasm in the experimental group for language study than in the control group, or whether this sort of study improved the pupils' understanding of certain grammatical matters (identifying parts of speech, for example). It was also not made clear exactly what relationship this teaching of vocabulary had to the normal school activities of the pupils, especially to their other English studies--writing, the reading of poetry or stories, grammar--in other words, how this part of their study was integrated into the whole of language, composition, and literary study, and for what specific purpose the vocabulary was taught.

It might be interesting to do a version of this study along the lines suggested by Deighton (see the review later in this Chapter), who argues that through a knowledge of word parts it is possible to determine whether a word is negative in force, has unfavorable significance, indicates small size, or (if the word is used as a modifier) indicates similarity or likeness--but that these discoveries are the only consistent ones that can be derived from the parts.

Currie

A study devoted to a comparison of the effectiveness of the independent discovery method (inductive) and the direct teaching method (deductive) was carried out with great elaborateness by Winifred Currie in a generally well designed and fruitful doctoral thesis.⁵ Following the lead of an earlier study (Florence Hogan, "Comparison of Two Methods of Teaching Word Meaning Through the Use of Word Parts in Grades Ten, Eleven, and Twelve," doctoral dissertation, Boston University, 1961), this study dealt with pupils in grades seven, eight, and nine.

Considerable preliminary investigation of previous studies in the teaching of vocabulary led to the conclusions that there is substantial (though hardly conclusive) evidence to support the notion that a knowledge of word parts is useful in reading; that there is a close correlation between reading ability, spelling, and visual memory; that the inductive "classification" method of teaching has validity; and that pupils often learn skills better in teams of two or three than singly. Using a battery of five tests for grouping pupils according to their knowledge of word parts, reading ability, vocabulary and reading comprehension, spelling, and visual memory, Currie established her experimental study in the following manner: 823 pupils in the seventh, eighth, and ninth grades in two public schools in the Boston area were divided into three groups--independent discovery (Method A), direct teaching (Method B), and regular classroom practice (Control), the groups containing, respectively, 283, 279, and 261 pupils.

⁵Winifred Currie, "An Evaluation of Two Methods of Teaching Vocabulary Through the Use of Word Parts," unpublished doctoral thesis in Education, Boston University, 1963.

Two sets of thirty exercises each were constructed. In one set (for Method A), the meaning of a word-part was to be discovered independently by a pupil after or during practice in classifying the words according to similarities of structure and meaning. In the other set (for Method B), the meaning of the word-part was taught directly to pupils through the use of a glossary and through practices provided for applying this knowledge deductively to the solution of meanings of derivative words. The same word-parts were introduced in identical order of sequence in the thirty lessons of each method. There was a total of fifty-one prefixes, thirty-seven suffixes, and 102 word-roots. Method A provided practice in classifying 1,593 different words with 190 word-parts. Method B used, in various contexts, 1,210 of the same words as A. Seventy-six per cent of the words containing the 190 word-parts were common to the exercises of both methods. The words ranged in difficulty from the third to the twelfth grade as reported in the Thorndike-Lorge list.

The exercises for each method were self-directing and self-correcting. Students were put in pairs or groups of three and were given forty-five minutes weekly to complete and correct the exercises. Each pupil had his own set of exercises and wrote answers directly on 8 1/2 x 11 inch sheets. Each team in B practiced with the glossary of word-parts, which they consulted at the beginning of an exercise, to learn the meanings of the word-parts to be introduced in that particular exercise. The experiment lasted ten weeks.

The experimental materials replaced any formal vocabulary instruction in English classes for the ten-week period. Pupils in the Control Group were taught vocabulary according to the methods originally planned to be used by the teachers, with the stipulation that forty-five minutes per week must be given to this instruction.

The statistical data were derived from a series of five tests given before and after the experiment: (1) The California Reading Test, Junior High Level, Forms Y and W; (2) The California Language Test, Junior High Level, Forms W and Y; (3) The Morrison-McCall Spelling Scale, Lists 2 and 4; (4) The Hogan Applied Word Parts Test, Forms I and II; and (5) The Beckwith-Hedrick Visual Memory Test, Forms I and II. These tests were used to measure possible gains in (1) knowledge of word-parts, (2) reading ability, (3) vocabulary and reading comprehension, (4) spelling, and (5) visual memory. The data were analyzed in reference to total population, grade level, sex, and intelligence levels, and there was also an attempt to ascertain the pupil's opinions about the materials and procedures.

The conclusions were consistently in favor of Methods A and B over the Control methods, and less strikingly, but still positively for Method A over Method B. All groups, however, made gains. The comparisons were made for each method with the Control group, and not with each other. Judgments as to the superiority of either Method A or Method B over the other were based upon their comparisons with the Control group. More specifically these results were reported: (1) Methods A and B were almost equally effective for teaching word-parts and both were superior to the Control methods; (2) Method A appeared more effective than Method B for improving general reading ability, and both were superior to the Control methods; (3) Method A was slightly more effective than Method B for improving vocabulary ability, and both were superior to the Control methods; (4) Method A appeared to be more effective than Method B for improving reading comprehension, but A was the only method to register statistically significant gains in reading comprehension on the California Reading Test; (5) Method A was definitely better than Method B in improving spelling ability, but only A showed statistically significant gains on the Morrison-McCall Spelling Scale; (6) Method A was slightly more effective than Method B in improving visual memory; (7) Methods A and B were almost equally effective in improving language ability; (8) Method A was generally superior to Method B, and both of these methods were superior to the Control methods at all the grade levels, though Method B showed slightly greater gains in knowledge of word-parts and visual memory in Grade Eight, and they were equally effective for Grade Seven in teaching vocabulary and improving language ability. In vocabulary, Grade Seven showed the greatest gains of the three grades; (9) Intelligence was a factor but not a statistically significant one. All groups gained, with slight advantage to the more able in word-parts. Both the more able and the less able improved in reading. The less able in both experimental groups made greater gains than the more able. Method A appeared to be more effective generally for all intelligence levels; (10) Sex was a factor but not a statistically significant one. All groups gained in word-parts, with the girls taught by Method A and the boys taught by Method B doing somewhat better. Boys taught by either Method A or B made greater gains in reading than did the girls; (11) Pupils in Grade Eight reacted most favorably to the experiment, showing greater preference to Method B. Seventh graders liked the experimental methods equally well, and the ninth grade pupils had the least favorable reactions. The reactions to team learning were especially favorable in Grades Eight and Nine. All told, about two-thirds of the pupils reacted favorably to the experiment.

In conclusion the author recommended that there be more self-correcting and self-directing materials devised for Grades Seven, Eight, and Nine, and that team learning be used more extensively for practice in skills subjects.

In general, this was a well designed study and its results should have considerable validity, though the implied superiority of the inductive method for vocabulary teaching needs further verification. Too, it probably would have been advisable for the investigator to have controlled the teaching in the Control group more carefully. There is no mention of the techniques used by these teachers, so that any comparisons between the experimental methods and those used for the control group as a whole are not as exact or as informative as they might have been. Further, although the materials seem to be generally sound, they strike the present investigators as being exceedingly dull, and, like most such vocabulary lessons, they concentrate a disproportionate amount of time on purely Latinate affixes and word-roots, almost as if there were no native English units in derived or compound words. Some of the words used in Method A for classification purposes seem strained or unlikely (e.g., INTO as the meaning for the prefix en- in encourage, enlighten, etc.), and there is practically no help for the student in making appropriate "morphemic" cuts (separating the affixes from roots), or for distinguishing actual affixes from accidental sequences of the same letters, e.g., worker vs. hammer.

Catterson

The two methods of teaching word analysis--the inductive (referred to as the "meaning") and the deductive--were compared by Catterson.⁶ The inductive method in this study depended on giving the pupil multiple contacts with words to develop word analysis skills. All words encountered in the inductive technique were in meaningful context. In contrast, the deductive technique, labeled the "rules and exceptions" method, began with the presentation of a rule, followed by numerous exercises designed to help the child become familiar with the rule.

While the investigator was primarily concerned with discovering the method which would most effectively improve student reading and spelling abilities, she also was concerned with the extent to which

⁶Jane A. Catterson, "Inductive Versus Deductive Methods in Word Analysis in Grade Five," unpublished doctoral dissertation, Boston University, 1959.

vocabularies were improved during the course of the study. Thus, the relationship between the deductive method of this study and the direct method frequently used in teaching vocabulary is obvious. Too, the method of teaching words by frequently encountering them in context is precisely the procedure advocated in the context approach to vocabulary teaching.

Catterson's investigation involved the designing of a series of lessons for those pupils being taught by the inductive method, as well as a totally different set of lessons for those subjected to the deductive method. Each lesson was typed on a separate card. For the inductive group, the cards contained three major classifications and forty words listed alphabetically, each of which was to be placed under the most appropriate classification. Each of the forty words was related to one of the three classifications which might be listed--for example: dessert, farm, and travel. As the children classified the words, they presumably gained experience with them which made them meaningful.

The deductive group, on the other hand, received cards with an equal number of words but with a rule at the top and space at the bottom for using the rule to classify the words.

The pupils of thirty-one fifth grade classes were designated as subjects. The group totalled almost 1,000 at the beginning, although it had diminished to 749 upon completion of the three-month experiment. Each pupil was placed in one of three groups so that the mean chronological age, mental age, and I.Q. of the groups were almost identical. Experimental group "A" was taught by the inductive method, experimental group "B" by the deductive method, and the control group continued learning under normal classroom conditions. To lessen the teacher burden the children in each group were paired according to ability; thus two pupils worked together and when they finished a lesson, corrected it themselves, thus further lessening teacher burden and providing instant feedback.

The experimental lessons replaced the regular classroom spelling instruction for three months. These lessons were immediately preceded and followed by a battery of six tests.

Examination of the data provided by the study indicated that all groups made comparable gains in both spelling and word pronunciation. For some unclear reason, all groups also demonstrated a similar decrease in reading comprehension. In total reading achievement and vocabulary, however, the inductive method produced superior gains. In both instances, too, the group taught by the deductive method manifested

almost exactly the same amount of gain as the control group, while the inductive group doubled that gain. The specific gains made in the area of vocabulary achievement were a 7.0 month improvement by the inductive group, a 3.5 month improvement by the deductive group, and a 3.6 month improvement by the control group.

In spite of the fact that this study was an extensive and carefully executed examination, some questions remain regarding conception and design. Specifically, there was a failure to take into consideration the teacher variable and the possibility that a teacher might show preference for one method over another. The data suggest that some such preference did exist, or that errors were made in the constructing of lessons for the deductive group. Although the teachers tended to approve generally of both the inductive and deductive lessons, they made the following complaints about the deductive lessons: (1) they were frequently too hard for grade five students, (2) they required a good deal of teacher time, and (3) there was an inadequate number of exercises with each lesson. No complaints were made about the inductive lessons.

It would appear that the study further favored the inductive group in that the words for their lessons were selected and presented with the primary goal of making them interesting for the students. In contrast, the words chosen for the deductive group were selected, not with interest in mind, but to provide examples for particular concepts to be taught.

Regardless of these weaknesses, the study does illustrate a certain potential for the inductive method. As previously pointed out, this technique is frequently applied to vocabulary teaching under the title of the "context method." A possible advantage, as implied by the teacher comments above, is that it requires less teacher time.

Corcoran

Paralleling the Catterson study in purpose, design, and execution is a study by Corcoran.⁷ The principal differences between the two studies are that Corcoran experimented with third grade rather than fifth grade children, that her experiment was conducted over a six-weeks' period rather than three months, and that the results obtained were strikingly dissimilar.

⁷Clare Mary Corcoran, "Inductive Versus Deductive Methods of Teaching Word Analysis in Grade Three," unpublished doctoral dissertation, Boston University, 1961.

Corcoran employed the same type of lesson cards and pairing of pupils. The 616 pupils were divided into three groups in the same manner prior to the beginning of the experiment and a battery of tests was administered and balancing procedures were employed to ensure equality among the groups. While Catterson's study replaced the regular spelling practice, Corcoran's lesson cards replaced the normal classroom use of the reading workbook. The experimental groups used the prepared lesson cards for twenty minutes daily.

Although the reason is not immediately clear, the two studies produced dissimilar results. Whereas Catterson reported significant improvements by those pupils being taught word analysis by the inductive method, Corcoran found that none of the three groups made significant gains. These divergent results were possibly a result of either pupil age differences or of the shortened time span encompassed by the Corcoran study. The data offered by Corcoran fail to show any tendency toward improvement of either reading achievement or vocabulary upon completion of the experiment, thus suggesting that the difference in the amount of time spent working with the lessons is not responsible for the lack of improvement. There is an implication that a developmental unreadiness for word analysis might have been responsible for the lack of advance--an implication not substantiated by the data offered.

Taken together, the Catterson and Corcoran studies of the inductive method of teaching word analysis present a confusing picture of its potential. Obviously, more research is needed to demonstrate adequately the potential of this technique, as well as its applicability to vocabulary teaching.

Young

A 1951 doctoral dissertation attempted to discover, in a unique way, the effect of presenting words in meaningful context upon the learning of those words.⁸ This investigation had two major purposes: (1) To determine the value of the context method in building vocabulary, and (2) to determine whether words are learned most readily when encountered in material read orally, read silently, or listened to on a tape recorder.

⁸James Douglas Young, "An Experimental Comparison of Vocabulary Growth by Means of Oral Reading, Silent Reading, and Listening," unpublished doctoral dissertation, University of Southern California, 1951.

This study was conducted at George Pepperdine College and employed 450 college students from all academic levels. The Cooperative Vocabulary Test, Form Q, was first administered to all subjects. Following the administration of this test, the subjects were exposed to stories, written by the investigator, that included all 210 items previously encountered on the test. Prior to participating in the experiment, the students were divided into three approximately equal groups. Each group experienced the stories in a different manner. The Oral Reading Group read the stories aloud; the Silent Reading Group read the stories silently; and the Listening Group heard the stories played on a tape recorder. Immediately after the subjects were exposed to the stories, the Cooperative Vocabulary Test, Form Q, was re-administered. Each administering of the test required twenty-seven minutes. These testings were separated by fifteen minutes, during which the subjects were exposed to the stories.

All experimental groups demonstrated tremendous gains between pretest and posttest. The investigator suggested that this is adequate proof that presenting words in meaningful context is a practical technique for vocabulary building. The following table presents pretest and posttest scores, and the mean gain for each of the groups:

TABLE IV

Group	Pre-Test	Post-Test	Vocabulary Gain
Listening	93.899	127.680	33.781
Silent Reading	97.077	136.245	39.168
Oral Reading	88.847	129.067	40.220

Although all groups made large gains, the Oral Reading Group's gain was the largest. The Silent Reading Group was not, however, significantly inferior to the Oral Group, while the Listening Group was positively inferior to both other groups.

Many factors contributed to the differences between the various groups. The subjects for all three were grouped by chance. No attempt was made to equate the groups on any basis, as the experimenter felt the size of each group would assure near-equality. To be certain, however, he later compared the groups in terms of the

following five variables: academic year, age, sex, I.Q., and foreign students represented. He found that academic standing did have significance, with seniors making greater gains than freshmen. This variable might well have influenced the superior gains made by the Oral Reading Group since it had a smaller percentage of freshmen than either of the other groups. At the same time, the Silent Reading Group was hindered by a shortage of seniors. Sex and physical age were found to exert an insignificant influence on the mean gains. Age, however, was found to be an important consideration, even though it was not here an influencing factor due to equal distribution. Older students generally made slightly higher gains.

The influence of I.Q. upon vocabulary gains was also found to be insignificant because of distribution. A positive relationship was discovered, however, between I.Q. and size of vocabulary. When the data were checked, it was found that the highest gains were made by those students with mid-range I.Q.'s rather than by those with extremely low or high I.Q. ratings. It was also found that vocabulary gains made by foreign students were significantly smaller than those made by other students. The Silent Reading Group contained fewer foreign students and should have, therefore, enjoyed an advantage over the other two groups.

The investigator also suggested that since testing was done by means of a silent reading test, it may well be that the Silent Reading Group received an advantage over the other two groups. He suggested that construction of speaking and listening tests would reduce the possibility of this error in the future.

Apparently the investigator ignored or overlooked the effect of practice upon the results. When first exposed to the test, the average student missed more than one-half of the items. As the words were presented in meaningful context a few minutes later, these students unquestionably recognized some of the words as those they had just missed. Then, when they were given a second chance to take the test, they obviously were capable of recalling some of the terms just defined by presentation in stories. Thus, the practice effect would appear to have exerted as much influence on the mean gains as the learning in context technique.

Johnston

Much attention is being given at present to the use of programmed instruction in the classroom. The current research, although

voluminous, does not clearly favor nor discredit such instruction.⁹ A study in the language arts area was conducted by Kenneth Johnston, who wished to explore the implications of a finding by Baldwin and Hite which demonstrated that, of five methods employing programmed material, the "systematical supplementation" technique resulted in more learning than any of the other four.¹⁰ Johnston compared the difference in both achievement and retention between classes taught by the "conventional" method and those taught by a method which was supplemented by programmed material.

His sample included eighth grade pupils from six schools in the Columbia Basin: 134 taught by the conventional method and 134 taught by the systematical supplementation technique. The Columbia Basin schools included children of government employees and of military personnel, children from rural families and from small urban communities. In three schools all of the eighth graders were used. In each of the other three schools there were two sections taught by the same teacher, one section for each method.

The conventional method, as defined by Johnston, employed lesson plans, work sheets, and related language arts material. The teachers using the systematical supplementation method followed a program text, SRA Words: A Programmed Course in Vocabulary Development. The lesson plans used in the conventional classes were developed by Johnston to cover the same material as that presented in the program.

In addition to his general hypothesis, Johnston tested the effectiveness of programmed instruction when intelligence was controlled and again when initial achievement in reading comprehension and vocabulary was controlled. He further analyzed his data by classifying his six schools into two categories: first into higher and lower intelligence (assigning three schools to each category) and then into higher and lower reading achievement levels (again assigning three schools to each). However, the means for the schools on intelligence ranged only from 104.06 to 113.72 with none having a mean below average. Of the six schools the lowest mean score for reading achievement was 67.43 and the highest 77.96.

⁹Kenneth Albert Johnston, "Programmed Instruction Versus Conventional Teaching: A Study of Learning and Retention in Language Arts," unpublished doctoral dissertation, Washington State University, 1964.

¹⁰Elmer D. Baldwin and Herbert Hite, The Effectiveness of Different Forms of Supplementation as Adjuncts to Programmed Learning, Research Report 05-14 (Olympia, Washington: State Superintendent of Public Instruction, 1963), Mimeographed.

Initial tests given to all of the students were the Henmon-Nelson Test of Mental Ability, the Gates Reading Survey, and a pretest of thirty-nine items prepared by the author of the program, with no significant difference between the two method groups on any of these initial measures. Other factors controlled included the teacher factor (each teacher teaching a class under each method) and the concepts being studied. Johnston did not indicate whether or not both groups studied for equal amounts of time each day.

The experiment ran for five weeks during which time the programmed group completed the first six chapters of the program (733 frames); the conventional method group followed eighteen lesson plans which covered the same concepts as those presented in the program.

At the end of the five week period a final test, consisting of the thirty-nine items in the pretest and fifty-five additional items, was administered to all classes as a measure of achievement. Twelve weeks after the final test, a delayed posttest (a repeat of the final examination) was given as a measure of retention.

A one-way analysis of variance indicated a significant difference ($P \neq .01$) between the two method groups on the final examination with the systematical supplementation group scoring higher. On the delayed posttest, however, there was no significant difference.

Johnston then analyzed his data, using the covariance technique. He found that when he controlled for the pretest scores, there was no difference between the two groups on those thirty-nine items included in the final examination, although by analysis of variance there had been a difference significant at the .05 level of significance. One might ask if a test of significance of difference between means for change in scores on the thirty-nine items (posttest minus pretest) would not have been more appropriate than the analysis of variance of the posttest (Johnston's term for the thirty-nine pretest items included in the final).

Johnston further discovered that when the groups were controlled for intelligence (Henmon-Nelson scores) there was no significant difference; nor was there a difference when he controlled for achievement test scores (Gates Reading Survey scores). An interesting change was noted when he controlled for scores on the final examination and compared the groups on their delayed posttest scores: the difference, although not significant, was in favor of the conventional method.

Some questions arise when one studies the results of this experiment. One concerns the test questions used as a measure of

achievement and retention. Since these were prepared by the author of the program, is it not likely that they bore more similarity to the type of statement made in the program than to the exercises given to the conventional classes and were therefore more likely to be answered correctly by those students who studied the program? Is it also probable that the students in the programmed group recognized similarities between the pretest questions, given before the experiment began, and their material? The author of the program had designed these questions as a diagnostic instrument, and the alert student would be likely to note the answers as he progressed through the program. Nothing was said relative to teachers' communication to students about the pretest questions and the correct answers. It is possible that the higher final score achieved by the students using the program resulted from short term retention of specific questions raised in the program rather than from knowledge of the concepts. With the passage of time, even twelve weeks, this retention dissipated so that on the same test the programmed group showed no superiority. The question then arises of what was actually learned. Did the students have a better reading, writing, listening, or speaking vocabulary, better word attack skills, better understanding of word meanings? Or had they learned to echo answers to specific questions that did not transfer to other material or situations? What did the test results actually demonstrate?

Other pertinent questions might be asked about the backgrounds and biases of the teachers. Were these experienced teachers with a long history of teaching vocabulary development? Were they positively or negatively inclined toward programmed instruction or toward the techniques outlined in the lesson plans? Did they teach some of these students during other periods of the day? Did they discuss the experiment with the students? If so, what was done to equalize the Hawthorne effect? Would the experiment have been more meaningful if there had been some control groups receiving no special instruction in vocabulary but taking all of the tests and other groups receiving no instruction and taking only the final test? If the experiment had continued for a longer period of time, would the results have been different? Under a "systematical supplementation" plan would the busy teacher rely too heavily on the program and perhaps gradually shift the instructional responsibility in this area to the program itself? Would the students become bored with a semester's instruction that was oriented strongly toward linear programming?

Despite these questions Johnston has done a worthwhile study and has demonstrated an important aspect of data analysis: significance of differences may depend upon the statistical test employed. He has

pointed out in his conclusions certain pertinent questions relative to teacher background that need to be pursued e.g., "Do teachers with limited experience in a particular area of study do better with one or the other method?"

In addition, Johnston has demonstrated that for a specific set of concepts the "systematical supplementation" of programmed materials produces learning equal to that of well constructed lesson plans which cover the same material. Whether any other knowledge or skill is gained or lost by such instruction was not explored. For inexperienced teachers the results of this study might be a reassurance or an aid while tackling the many other tasks facing the new teacher. However, a close examination of the material used, of the behavioral outcomes desired from the students, of the apparent transfer value of the material taught, and of the general motivation of the students would be essential under any circumstances. As Johnston pointed out, the program was only a "systematical supplementation."

Wilson

Another investigation of the effectiveness of teaching vocabulary with programmed materials was made by Wilson, who compared the vocabulary growth of first grade children taught under three different methods: automated (programmed), non-automated (combination word-picture and word-identification methods directed by the teacher), and adjunct autoinstructional (a combination of the first two methods).¹¹ In addition a control group which received no special instruction was tested.

Wilson's sample included sixty white children from two schools in Tuscaloosa, Alabama, divided into four treatment groups of fifteen each, with each group representing the portion of a class who could be equated with pupils of the other classes by means of the California Short Form Test Of Mental Maturity, 1963 revision, and a pretest of the words to be used in the study. An analysis of variance showed no statistically significant differences among treatment groups as to I.Q. and knowledge of the specific vocabulary to be taught.

¹¹ James R. Wilson, "A Comparison of the Effectiveness of Automated, Adjunct Autoinstructional, and Non Automated Procedures for Teaching Sight Word Recognition to First Grade Pupils," unpublished doctoral dissertation, University of Alabama, 1964.

The automated group used the Teachall Reading Program, which presents forty-eight words in 384 frames, with eight words and thirty-two frames in each of twelve units. Except for the initial instruction in describing the program and in explaining how to use the machine, no teacher instruction was given this group.

The non-automated group was taught by the investigator as a regular classroom. The forty-eight words were printed on sheets of newsprint, each beneath a picture that elicited the same response as the word, with four pictures and words on one sheet of newsprint. In order to correspond with the programmed units, the forty-eight words were divided into six experimental units of eight words each, with two lessons in each unit.

The "adjunct autoinstructional" group used a combination of the other two methods. The same word unit division was followed as in the automated group with half the frames used. Newsprint pictures were displayed on the wall and used by the investigator in identifying the word for the subject and in checking on the understanding of the subject. The picture charts remained on the wall for all of the classes with no mention being made of them to the automated group.

The units were presented on six days and were followed immediately by a test of forty-eight words printed on flash cards. Twenty-four days later a posttest including the same words was administered. An analysis of variance and appropriate t tests revealed that the only significant gains were between the control group and the other groups: on the immediate test all three experimental groups scored significantly higher statistically than did the control group, but there was no significant difference between any two groups on the delayed posttest; none of the experimental groups, however, scored lower than on the immediate posttest. Wilson stated that apparently the control group learned the words during the twenty-four day interval and the experimental groups reviewed them so that the initial learning was reinforced.

An attempt was made to control several important variables such as I.Q., previous knowledge of words, exposure to materials, order of presentation of materials, and the teacher.

Questions might be raised concerning the length of the study, the type of instruction used in the control group, the small number of students in each group, and the failure to equate the total population of the groups under the three treatments. Since interaction among class members may affect the climate of learning in a classroom, the comparison of only fifteen members of one group with fifteen

members of another group fails to consider certain differences that may influence the outcome of the study. Also, had the study continued for a longer period of time, other reactions might have appeared.

The investigator described the methods as "different from those of the control group." Did this statement mean that all three methods were new to the children? If so, could not the Hawthorne effect have produced the initial differences? One wonders, too, why the control group was motivated to learn the words after the first posttest. Were the words part of the regular vocabulary of the first grade? Apparently the group unexposed to any of the special methods had no difficulty in reaching the level of the other groups by the time of the delayed posttest. Further, nothing is said about other language activities taking place in conjunction with the vocabulary instruction.

Despite the unanswered questions, Wilson's experiment has raised an issue that needs further study with a larger group over a longer period of time. In the automated group the teacher was able to handle a larger group of children; yet the learning of sight vocabulary was not significantly different from that under teacher direction in a smaller group. An administrator interested in exploring the efficiency of teaching first grade reading might profitably pursue research to investigate the hypothesis that for certain skills primary age children can learn as effectively in a large group using automated instruction as in a small group under teacher direction alone. A confirmation of the hypothesis might suggest that under such a program of automated instruction more teacher time would be available for a concentrated attack on the problems of those children experiencing difficulty or for the further stimulation of those children who were progressing beyond the average demands of the class.

Prentice

A study by Prentice attempted to test the following hypothesis: "Semantic and syntactic meaning make separate contributions to word learning, and . . . acquisition of syntactic meaning, with or without semantic meaning, would facilitate grammatical use of new words in new sentences to a greater extent than acquisition of semantic meaning alone," a hypothesis designed to support the investigator's purpose of comparing the effects of syntactic and semantic meaning in word learning on subsequent use of new words.¹²

¹²Joan L. Prentice, "Semantics and Syntax in Word Learning," unpublished doctoral dissertation, Indiana University, 1964.

Preliminary to reporting the results of the study, Prentice discusses the terms used at considerable length and defines two kinds of meaning with some care: "Syntactic meaning" is defined as "the category shared by members of the same form-class." Shared attributes probably include, with item-specific exceptions, semantic commonalities as well as shared privileges of occurrence; "semantic meaning" is defined "simply as that which signified the referrent." It may be operationally induced by pairing a word with several instances of a referrent, so that when a subject has successfully completed a concept formation task by identifying various instances of the (non-verbal) concept via an assigned CVC (consonant-vowel-consonant) trigram, it is inferred that the subject has acquired the semantic meaning of the trigram. It may be inferred that syntactic meaning has been acquired when a subject consistently uses a word in the function of a given form class in different sentences.

In a pilot study, using twenty-seven eight and nine year old children, the results showed that the subjects who learned syllables in response to pictures only scored significantly lower on a test of grammatical use than the subjects of other groups who used syntactic clues only or a combination of the pictures and syntactic clues, and that for this small sample, boys did better than girls. This pilot study was also used to elicit from the pupils the kinds of trigrams that were to be used in the major study. After exhaustive tests of the pronounceability of the various possible CVC trigrams, and after eliciting from the pupils their preferences for certain ones, a final list of seven trigrams was set up, with each trigram being assigned to a different form class:

FUD	Proper Noun
GUV	Verb (transitive)
JAT	Adverb
KIL	Mass noun
LAN	Count noun
ROG	Verb (intransitive)
SIM	Adjective

The experiment was then set up as follows: Twenty-four boys and twenty-four girls in the fourth grade of University School, Blooming Indiana, were used as subjects. Within each sex, subjects were divided by a median split into high and low Word Knowledge levels based on the Word Knowledge scores from the Metropolitan Achievement Test and then randomly assigned to one of three training conditions. The Semantic Training Group (Sem Trg) learned the seven trigrams in response to sets of three picture instances of a referrent. The Syntactic Training Group (Syn Trg) learned the trigrams from sets of

three sentences omitting the words of one form class. The Both Training Group (Both Trg) learned from a combination of the other two. Before the student was given the tests, he had to meet certain criteria. The first stage criterion was one trial without error with stimuli presented randomly in intact sets. Subjects were then transferred to the second stage in which the sets were broken and the stimuli arranged in three different random orders. The resulting criterion was two trials without error.

Two tests were given following satisfactory training and meeting of criteria: a test of grammatical use required subjects to complete fourteen new sentences by using one of the CVC trigrams in each sentence; the semantic meaning test required subjects to match with the trigrams fourteen English words equivalent in meaning to the learned concepts.

The results were the following: In the acquisition of semantic meaning (demonstrated by identifying new verbal instances of the referent) the Sem Trg and Both Trg subjects scored nearly perfect but were not reliably different from each other (according to Duncan Multiple Range Test). The Syn Trg group was moderately successful. It was therefore concluded that: (1) semantic attributes can be inferred from grammar use but association with referent concept is a more effective method of acquiring semantic meanings, and (2) there is no evidence that syntax, when added to semantic meaning, facilitates recognition of new verbal instances of the referent.

In the acquisition of syntactic meaning (demonstrated by the use of new words grammatically in different sentences), the Syn Trg and Both Trg groups performed better than the Sem Trg group but not reliably different from each other. It was therefore concluded that: (3) semantic attributes can designate membership in a syntactic category, but grammatical use is a more effective method of acquiring syntactic meaning, and (4) there is no evidence that semantic meaning, when added to syntactic, facilitates the grammatical use of a word.

Other related conclusions were that: (5) the ability to use rules of syntax appears to be related to the frequency with which various form classes have been encountered in language, (6) neither chance selection nor the spew hypothesis can adequately predict the numbers of incorrect responses, by form class, made in completing a sentence, (7) responses chosen to complete grammatical constructions are selected systematically, probably under the continuing control of the stimulus, (8) there is no evidence that boys and girls differ in acquisition and use of verbal concepts, and (9) the Word Knowledge and Word Discrimination subtests of the Metropolitan Achievement Tests

are not profitable covariables in studies testing language skills similar to those investigated in this study.

This study attempted to do a great number of things with very few subjects and certainly, though the conclusions are suggestive and generally credible, there would need to be many more pupils involved for the results to be persuasive. Moreover, one possible practical objection to the linguistic design might be that the investigator took too little cognizance of the pupils' previous experience with the morphology of the language or of the way morphological categories function in syntactic relations. Though it may be true that a pupil can derive small semantic meaning from LAN in syntactic context it doesn't follow that he could not derive such meaning from blackbird or happiness; and conversely, though a pupil may not be able to use in a new sentence whatever meaning he has assigned to LAN from identifying it with a referent it doesn't necessarily follow that he will be equally unequipped to fit blackbird or happiness (which possess grammatical clues) into new sentences. The general conclusion that these two kinds of meaning function somewhat separately seems unchallengeable, but the use of nonsense syllables probably interfer with the investigator's taking account of many features of real language that the student is familiar with and has operated with for six or seven years already.

Generally, except for objections to the size of the subject-group and to the limited validity of nonsense syllables to establish the investigator's specific premise, and also perhaps to the vague description of the composition of the experimental group, the study is a worthy one. Although it does not, in its present form, furnish many clues for modifying or improving the teaching of vocabulary to fourth grade pupils, it does throw some light on the capacities of fourth graders to operate with certain kinds of language material.

Deighton

Differing from many of the studies reported in earlier sections is the publication Vocabulary Development in the Classroom by Lee C. Deighton,¹³ which is a rather comprehensive analysis of vocabulary teaching. Though the author identifies this report as a study in his introduction, in actuality it is a report of investigations of the author into certain methods directed at vocabulary teaching in use two decades or more ago when the study began and also in use currently.

¹³ Lee C. Deighton, Vocabulary Development in the Classroom, (New York: The Institute of Language Arts, Teachers College, Columbia University, 1959).

According to the author, the study began with the examination of methods dealing with teaching roots, prefixes, and suffixes. Many of these he found inadequate and even misleading. Although the report of the study approaches vocabulary teaching positively and does not directly indicate the faults of particular methods of teaching word elements, some hints are given. For example, it is pointed out that some prefixes are identical in spelling to beginning elements of words in which these parts are not prefixes. Too, Deighton states that the suffixes -ance, -ence, -ism, -dom, -ery, -ation, -mony, -ment, -acity, -hood, -ness, -ty, -tude, -ship, though frequently taught in vocabulary programs, indicate part of speech only and give no clues to meaning, which presumably is the goal of instruction.

From his survey of the teaching of word parts, Deighton moved to an analysis of context teaching, reporting that passages examined in more than 500,000 running words of reading matter, varying from selections in technical books written for the medical profession to those in an anthology of readings designed for retarded eighth-graders, revealed far less about word meaning than is usually supposed.

Deighton points to several "truths" that are often overlooked but should not be. These include the fact that "words by themselves out of context have no meaning,"¹⁴ that dictionary "meanings" are only points of departure, that means independent of dictionary help are needed to get meanings of unfamiliar words, and that the concept of what word meanings are and how they are determined needs to be developed in students, a process requiring at least several years to accomplish. Most important of all, Deighton's final paragraph stresses that which many efforts at vocabulary teaching too frequently neglect. This paragraph is as follows:

What is needed for all learning is interest. A sense of excitement about words, a sense of wonder, and a feeling of pleasure--these are the essential ingredients in vocabulary development.

Deighton further states that context reveals meaning by definition, by example, by restatement, by qualification and by inference.

¹⁴Though, as Russell and Fea have pointed out, it may be that a word is always in context--not necessarily seen or heard but at least regarded by the individual seeing or hearing a word alone places it in his understanding in a context. (David H. Russell and Henry R. Fea, "Research on Teaching Reading," in Handbook of Research on Teaching, N. L. Gage, editor (Chicago: Rand McNally and Company, 1963).

He believes that students need to be taught that a form of the verb be usually indicates a definition; that the signal words such, like, especially, for example, and others, often give meaning by synonym or example in another context; that signal words such as in other words, that is, to put it another way, indicate a restatement; that phrases, clauses, and single words may reveal meaning through their use as qualifiers; that meaning may be gained through inference from repetition of sentence pattern, from repetition of key words, from the use of connecting words--however, yet, therefore, similarly-- and from restating the thought or its opposite. Deighton only mentions two punctuation items, the dash and the parenthesis, as helping to signal meaning, possibly overlooking the use of the comma for showing apposition, although his statement of the role of modifiers might have included this as well as others. He also does not mention the use of clues in the context which make use of experience (e.g., Fish begins to deteriorate quickly if it is not kept on ice), or the word-summary clue which gives meaning to a word by providing details rather than a definition or a simple restatement of the thought.

As is often stated there is evidence that a high percentage of English words have prefixes, with the implication frequently drawn from this that learning the most common of these will aid materially in gaining word meaning. Stauffer, for instance, has reported that fifteen prefixes account for eighty-two per cent of those in over 4,000 words containing prefixes found in a 20,000 word sample.¹⁵ One of these fifteen is de- (usually stated as meaning from, away from, or off) which Deighton points out as having lost its meaning in a substantial portion of such words (e.g., decease, decide, declare, demand). He also stresses the difficulty in gaining word meaning from many other absorbed prefixes, the futility of trying to make use of simulated prefixes, and the problems encountered with the multiplicity of meanings for many roots and suffixes. His most telling point, however, relative to word analysis as a means for teaching vocabulary, is the emphasis upon the great gap between the literal meanings as derived from such analysis and the current meanings of the words.

Deighton suggests six procedures, briefly identified below, as profitable for the teaching of word analysis as a means for dealing with unknown words. These are the teaching of:

1. Word parts with invariant meanings
2. English base words.
3. Words in combination.
4. Synonyms.
5. Antonyms and contrasting words.
6. Derivations.

¹⁵Russell G. Stauffer, "A Study of Prefixes in the Thorndike List to Establish a List of Prefixes That Should Be Taught in the Elementary School," Journal of Educational Research, February, 1922, pp.453-458.

In addition to the "procedures" the only other one suggested by Deighton as effective for applying apart from reading is the direct teaching of figures of speech.

The impression of the present investigators of this report by Deighton is that it is thoughtfully presented and includes many worthwhile suggestions and cautions.

Other Studies

Several investigators are currently studying vocabulary teaching, with some of their reports yet to be made. Two who have been long interested in this field and are currently (or have recently been) involved in the development of programs and materials are Brown and Dale.¹⁶ Their recent reports indicate somewhat divergent findings, though both indicate that caution should be used in making interpretations. Possibly their tentative findings indicate a need for different methods with different age groups.

Brown has reported on experimental studies directed at personnel of industrial concerns.¹⁷ One industrial personnel class met for five two-hour sessions per week for five weeks and another met for one hour and one-half session per week for eleven weeks. These groups used materials which had been tried in the University of Minnesota "Efficient Reading" classes. No report was made of control groups but Brown reported that in both classes programmed material was the most popular type.

From the vocabulary test administered he concluded that consistently strong evidence points toward programmed transparencies (which can be projected) as a classroom device with particularly promising potential. One of these positive effects was in the field of retention. Visual aids, including programmed transparencies, reduced forgetting of technical terms from seventy-two per cent, after fifteen months, to twenty-two per cent.

¹⁶ James I. Brown, University of Minnesota, and Edgar Dale, The Ohio State University. Material summarized here is in part from correspondence of the investigators with Brown and Dale.

¹⁷ James I. Brown, "Comparisons and Evaluations of Certain Vocabulary-Building Aids and Approaches," NSSC Journal, 1958.

In an unpublished report of a vocabulary-building experiment carried out during the summer, 1965,¹⁸ using two sections of University Efficient Reading classes, Brown further describes the effectiveness of programmed instruction and other visual aids. He concludes that, with these groups, "PYRAMID, a visualizing aid, seems to bring best results in memorizing, identifying, and applying prefix and root knowledge. PROGRAMMED VOCABULARY seems to bring best results in generalizing about language."

Since Brown has labeled his research as exploratory and has explicitly stated that these studies have laid the groundwork for more carefully controlled studies, no serious objections are in order. The reader, then, should remember that these findings are suggestive, only that the sample populations are highly selective (even though the age range in one group was from seventeen to sixty-three years), and that the motivation to learn was unusually high.

Dale, currently using vocabulary building materials with sixth, eighth, and twelfth grade pupils in the Columbus, Ohio, schools, has reported some conclusions relative to the eighth grade materials and methods. These include the following:

1. Much depends upon the teacher's interest and the extent to which the school is interested in vocabulary building.
2. A completely self-instructional approach is not satisfactory under typical classroom conditions.
3. The differences among pupils in a class make a single vocabulary building book inadequate. Particularly needed are special approaches for the students in the lowest third of the class.
4. Students are not highly enthusiastic about the self-instructional procedure.
5. Teachers need to be more flexible and skilled in using teaching practices and techniques.

¹⁸James I. Brown, unpublished report of research on vocabulary building, carried on during summer session, 1965.

IV

LINGUISTIC CONSIDERATIONS IN VOCABULARY STUDY

As was stated earlier, one of the central problems in any study of vocabulary is determining exactly what the matter to be studied is. The term vocabulary is commonly assumed to apply to "words," though occasionally an enterprising investigator suggests that perhaps "phrases" may also be part of the material to be mastered, but in either case, the terms themselves are likely to be very nebulously defined. Certainly, therefore, an investigator must decide, on the basis of whatever study he may make of language and phenomena associated with language, what the precise units of the study are to be, what it is that is to be taught (or investigated in relationship to pupils), and what, if any, extraneous materials need to be excluded from consideration. In this particular matter, he must determine presumably what "vocabulary" is, and what its variants are. Generally speaking, students of language have distinguished, either specifically in their studies, or more commonly in references, among various kinds of vocabularies: (1) speaking, listening, reading, writing vocabularies; and (2) vocabularies useful in formal, informal, or colloquial usage. By far the most common concentration in vocabulary studies has been on what are considered to be moderately formal reading vocabularies, and the spoken varieties of language, including the lexicon, have been relegated to a position of minimal attention. Obviously, then, an investigator must decide which among the various possible vocabularies he will investigate intensively, which (if any) he will ignore or subordinate, and what other aspects of language--grammar, phonology, semantics, situational and verbal contexts--he will incorporate in his study or utilize for his predetermined goals.

The Usual Vocabulary Material in Present Studies

Though there are some variants, the common approaches to vocabulary materials involve the following considerations: (1) The identification of the "word." Most investigators assume that the word is a self-evident element, a "given" and they attempt no particular definition at all. Usually the words are derived from such a list as the omnipresent Thorndike-Lorge list of 30,000 English words, or from a dictionary, or from various kinds of texts. Some few studies have attempted to define the word more clearly; they have, for example, excluded "compound words" or phrases of the "Jack-in-the-pulpit" type, but not many have concerned themselves with explicitly defining what they regard as obvious units.

(2) The words so identified are treated in various particular ways. Grammatically, they are divided into their morphological components, prefixes, suffixes, roots (especially those words borrowed from Latin), and are identified as to their parts of speech (seldom anything but nouns, verbs, adjectives, and adverbs). Some investigators--those who use the various "context" approaches--also put the words in verbal contexts, in "subject," "object," "predicate" groupings, or in positions in sentences where particular words may easily substitute for one another. Very seldom do any of the investigators systematically contrast the morphological shapes (though there are instances of rather haphazard and limited contrasts e.g., the suffix -age in courage, and message identifies the word as a noun, and the -en in harden and soften identifies the word as a verb, and so on) in the way that Fries does, for example, in The Structure of English,¹ or Roberts in his books, Patterns of English,² and Understanding English.³ Even less frequently do any of the investigators contrast words by stress -convict vs. convict, white house vs. White House -or use stress for "part of speech" differentiation --e.g., "The house he came to" (preposition) vs. "He came to" (adverb). In other words, the treatment of the grammatical features of the "word" (identified as a unit by fiat) is generally confined to identification of its part of speech, its composition (root and affixes), and occasionally its substitutability for other like units in sentence frames. And in the overwhelming number of cases, since the investigators are interested almost solely in teaching reading and writing, the word is handled in its written form, with most phonological features ignored, or at least not fully exploited.

Semantically, the words are listed with appropriate references to the objects or ideas they symbolize (table refers to that object characterized by a top, four legs, wooden construction, etc.), generally by association with pictures or with synonyms, antonyms, homonyms, or by such associations in conjunction with a semantic analysis of the word's components (pre- means "before" and -cede means "come," so precede means "come before"). Occasionally a more imaginative investigator or commentator will discuss the verbal clues that will lead to a semantic understanding of the word -- we can "infer" that luxurious means something like "rich" from seeing it in such a sentence as

¹Charles C. Fries, The Structure of English (New York: Harcourt, Brace and Company, 1952).

²Paul Roberts, Patterns of English (New York: Harcourt, Brace and Company, 1956).

³Paul Roberts, Understanding English (New York: Harper and Brothers, 1958).

"The young lady had grown up with such wealth that she had developed expensive, luxurious tastes that now, in her poverty, she could never exercise." (L. G. Deighton's⁴ treatment is a convenient and generally productive summary of such contextual clues.)

In summary, then, the typical vocabulary investigator picks his unit, the word; analyzes it morphologically; sometimes puts it in appropriate, syntactic context; associates it with a "referent" usually through pictures, synonyms, component parts, or short sentence definitions, or reveals ways of deciding on the referent by showing how the word meaning may be inferred from or stated in other words in specific verbal contexts.

Shortcomings of the Present Treatment of Words

The major difficulties in the treatment of vocabulary units (besides the general one of the units not being systematically identified) stem from the almost universal reliance on the school-book grammars of the 18th and 19th centuries, and on a fuzzy, undeveloped semantics.

A weakness underlying many is that the experimental materials are commonly based on the traditional school grammars to the neglect of modern structural and transformation grammars. Certainly the investigators must have familiarity with the studies in language of the past half-century. Both the structural grammars which have grown out of the work of Sapir,⁵ Bloomfield,⁶ Hill,⁷ Hockett,⁸

⁴Lee C. Deighton, Vocabulary Development in the Classroom, (New York: Bureau of Publications, Teachers College, Columbia University, 1959).

⁵Edward Sapir, Language (New York: Harcourt, Brace and Co., 1921).

⁶Leonard Bloomfield, Language (Henry Holt & Co., 1933).

⁷Archibald Hill, Introduction to Linguistic Structures (New York: Harcourt, Brace and Co., 1958).

⁸Charles F. Hockett, A Course in Modern Linguistics (New York: Macmillan, 1958).

Gleason,⁹ and others, and the generative-transformation grammars that are growing out of the pioneering work of Chomsky,¹⁰ Bach,¹¹ Lees,¹² et al, provide a more useful description of the grammatical forms of English as well as its morphological and syntactical patterns. As far as that goes, the grammars of Europeans like Jespersen, Sweet, Poutsma, Kruisinga, and the Americans Curme and Long would provide a much more accurate body of facts on which to devise vocabulary (or general language) materials for pedagogical purposes. An increasing number of studies are attempting to utilize modern linguistic discoveries--Johnson¹³ and Prentice,¹⁴ for example--but most have not yet done so.

Similarly, the materials need to be based on a stronger, more reliable and informed semantics than they are. Experimenters and investigators who are interested in teaching meanings must, as a minimal requirement, be familiar with the major currents in modern semantic study. Many of the studies fail to show even a grasp of the semi-scientific, rather nebulous but still useful discussions of the General Semanticists such as Hayakawa and Stuart Chase (much less the fountain-head of it all, Alfred Korzybski); even a greater number show no familiarity with such basic works as Ogden and Richards' Meaning of Meaning or Stephen Ullman's Semantics; and practically none show any close knowledge of such modern (or not overly ancient) commentators on meaning as Russell, Wittgenstein, Carnap, Skinner, or

⁹Henry Gleason, An Introduction to Descriptive Linguistics (New York: Holt, Rinehart & Winston, 1961) (revised ed.).

¹⁰Noam Chomsky, Syntactic Structures (Gravenhage: Mouton and Co., 1957) (Janua Linguarum, Series Minor, No. 4).

¹¹Emmon Bach, An Introduction to Transformational Grammars (New York: Holt, Rinehart & Winston, 1964).

¹²Robert Lees, The Grammar of English Nominalizations (Bloomington, Indiana: Research Center in Anthropology, Folklore, and Linguistics, 1960).

¹³Kenneth Johnson, "Programmed Instruction Versus Conventional Teaching: A Study of Learning and Retention in Language Arts," Ed.D. Thesis, Washington State University, 1964.

¹⁴Joan Prentice, "Semantics and Syntax in Word Learning," Ed.D. Thesis, Indiana University, 1964.

the so-called devotees of psycho-linguistics--Garvin, Osgood, Saporta, Carroll, Brown, et cetera. (See Bibliography.) The learning of meaning, whether grammatical meaning or semantic meaning, is an enormously complex operation, as learning any highly complex symbolic system is certain to be, and devising programs for learning meanings cannot ignore this complexity or fail to take it into extensive account.

In more specific terms, (1) there is commonly no differentiation made between the inflectional suffixes (marks for the plural and possessives of nouns, the tenses and participial forms of verbs, and the comparison of adjectives) and the derivational affixes (-ness added to happy resulting in happiness, changing an adjective to an abstract noun; or -er added to work for worker, changing a verb to an agent count noun; or en added to courage for encourage, changing a noun to a transitive verb; etc.). This is a central grammatical difference in any language, and one that is generally ignored by the investigators, though it should be added, in all fairness, that most of them tacitly exclude inflectional suffixes from consideration and address themselves only to roots and derivational affixes. Similarly, so-called "compounds" are seldom treated fully or clearly, with no differentiation between such varying types as blackbird (adjective plus noun), elevator-operator (noun plus noun), dropout (verb plus adverbial).¹⁵ And when we come to such oddities as lily-of-the-valley, and father-in-law, there is likely to be no explanatory comment at all that would assist the pupil in understanding such constructions.

(2) There is also no clear differentiation between active--"living"--affixes and purely etymological or historical ones, between such inactive suffixes as -ster in spinster and the active -ness of happiness, breathlessness, joyfulness, curiousness, etc.; or between a dead prefix such as ab- in absolve, as contrasted to the pre- of pre-determine, pre-tested, etc. (or for that matter, between the active pre- of these words and the inactive one of prevent or precede). Since active prefixes are likely to be known to the pupil to some extent already, and the dead ones perhaps not, there would certainly be some differences in the ways these two kinds of affixes might be approached, and it would probably be useful for a pupil to recognize the difference between current, generative processes, and the inactive, etymological results.

¹⁵Or, as the transformational grammarian might conceive it: blackbird is generated from "The bird is black;" elevator-operator from "The man operates an elevator;" dropout from "The student dropped out of school," etc.

(3) There is no clear differentiation between what can be learned about a word from its form or syntactical occurrences--that is, its grammatical nature or meaning, its morphological and syntactical identification--as opposed to what can be learned of its referential meaning, either from its morphological elements semantically defined, or from its verbal contexts, its occurrence with other words whose semantic nature is known. Deighton's¹⁶ discussion of these verbal contexts, though not experimentally verified, are perceptive and suggest avenues to explore, and Prentice's study,¹⁷ though narrow and even then not wholly satisfactory, is certainly useful, but with these exceptions the problem is not attacked intensively by the investigators. There are obvious overlaps between the "meanings" that can be derived from the grammatical features of an utterance and the semantic features--a word is embedded both grammatically and semantically in an utterance, or has both grammatical and semantic relationships to other words. Morphologically, for example, courage, encourage, and courageous contrast as noun, verb, and adjective, and syntactically we can identify karakul as being a word like cat by seeing it in such frames as "I see the cat," "I see the dog," "I see the karakul," or we can identify ambivalent as being grammatically in the same class as immediate and severe by such a frame as "His reaction was immediate," "His reaction was severe," "His reaction was ambivalent." At the same time, we can class words semantically into groups--shrill, screeching, shrieking, raucous; or work, job, profession, employment, etc.--by studying their common referents or by studying the likely verbal environments of the words--"A dog runs," "barks," "jumps," but doesn't "meow," "moo," "read," etc. (except troublesomely in fantasy). Simultaneously, therefore, in the sentence "He has a profession," profession is identifiable grammatically as a noun by virtue of the suffix -ion, and by its occurrence after the determiner "a" and the preceding verb "have," and is semantically related to such words as provision, procedure, protection, by the prefix "pro-," to other words like confession, by the root "-fess," and to other words like secession, depression, etc., by the suffix -ion, with whatever meanings may be commonly attachable to these units, and to a whole range of other words by virtue of being "had" or "possessed" or "engaged in" as signified by the verb form "has," and of being possessed by males as signified by the pronoun "he," and of being had as a singular unit as signified by the word "a."

¹⁶Deighton, op. cit.

¹⁷Prentice, op. cit.

The famous example by Sapir in his Language,¹⁸ "The farmer killed the duckling," reveals the multiplicity of clues to both grammatical meaning and semantic content that is inherent in simple sentence forms: grammatically we know that farmer is a noun, is singular, and signifies the "actor," that the action of the actor occurred in the past time, that the recipient of that action is another singular object; but semantically we also know by the suffix -er that the subject of the grammatical construction is an agent of an action (compare worker, laborer, hunter, fisher, etc.), that the object of the action is capable of being killed (is animate, in other words), and is diminutive (signified by -ling). And this analysis, as a reading of Sapir's own discussion easily reveals, is enormously superficial and incomplete. There are, in other words, a great number of grammatical and semantic categories discoverable from the text, the methods for so discovering them are not difficult to delimit and describe, and the kinds of meanings that specific forms help uncover are also not impossible to delimit, describe, and differentiate. Most of the investigations, however, have presented few such clues for the use of the pupils. One of the probable results of this is that "context" methods have often proved unsatisfactory, not perhaps as a result of some inherent defect in the notion of using context, but through a superficial presentation of contextual clues and a failure to encourage the pupil to use his knowledge of the language--which is considerable--for the great range of discoveries he could use it for. That a more elaborate and clearer treatment of such clues would result in the acquisition of new words in their grammatical and semantic meanings is, of course, only supposition, but certainly there is need for studies in which such contextual features are clearly explicated and consistently utilized.

(4) A common oversight of the studies is the importance of dialectal differences. The assumption in most investigations seems to be that all Americans share a common dialect; that all words have universally accepted meanings; that all regions of the country are likely to use the Thorndike--Lorge words with equal frequency, for the same purposes, and with similar effects. If we confine ourselves to reading relatively formal exposition, or to literature that uses little local dialect color either in its expository and descriptive passages or in dialogue, then there is a certain validity to such a belief. If, however, we extend the teaching of vocabulary into speech (under the not unreasonable assumption that it would be useful for children to enlarge and make more precise their spoken

¹⁸Sapir, op. cit., Chapter V.

vocabulary), or into less formal styles, then it would seem useful to assist a pupil in acquiring vocabulary items--slang, "colloquial" expressions, local references to flora and fauna or to geographical phenomena--in their appropriate local pronunciations and uses, or at least to call such attention to them that the pupil is aware that these words are purely local and will not be widely understood in other regions of the state or country. Possibly one useful application of knowledge of dialect vocabulary would be to contrast or compare particular local words with the more common item, or with the word in more extensive use in educated society. It would, for instance, be useful for a Bostonian child to know that if he asks for "tonic" outside his own region, he will get, not a soft-drink, but folk medicine or hair-tonic, etc., or that if he talks about chinquapins in Texas, he may simply puzzle his hearers. This is all to say that as long as schools confine their teaching of vocabulary to its use in reading and writing, the present neglect of dialectal differences may not be excessively damaging, but if schools ultimately decide that speech needs to be dealt with as well as writing, then such differences must be given heed to, and can, as a matter of fact, be productively used.

(5) There has also been insufficient attention paid to explorations of language acquisition. Jean Berko's study on children's acquisition of morphology¹⁹ reveals that at least for pre-schoolers and first-graders, not all syntactical or morphological patterns have become generative (e.g., they cannot generally add the (-əz) mark for the noun plural or possessive and the verb third person singular with complete accuracy), and that there is little active use of derivational devices (adding affixes to create new words). Werner and Kaplan's study²⁰ shows that the young child (up to ten or so) does not "analyze" a sentence as an adult might, that words are apparently at this age not quite the independent identifiable entities they later become for the user of the language, and that the child's capacity to delimit the meaning of a word is not identical with an adult's--or an older child's. Roger Brown²¹ suggests that, though the semantic definitions of parts of speech do not work

¹⁹Jean Berko, "The Child's Learning of English Morphology," Word 14, 1958, 150-77.

²⁰Heinz Werner and Edith Kaplan, "Development of Word Meaning Through Verbal Context: An Experimental Study," Journal of Psychology, 29:30, 1950, 251-7.

²¹Roger Brown, "Linguistic Determinism and the Part of Speech," Journal of Abnormal and Social Psychology, 55, 1957, 1-5.

sufficiently well for adults, they seem to work fairly well for children, since the children's words (in English at any rate) are tied fairly closely to concrete objects and actions, though, as he points out, never entirely. Whatever the reliability of these and other related studies, they certainly should not be ignored by the designers of experimental studies in the teaching of vocabulary as they commonly are. In fact, it seems reasonable to assume that insofar as they are ignored, the experimental studies will be partially invalidated from the beginning.

(6) The experimental materials suffer commonly from exceeding dullness. The study of words and their structure, use, and etymologies is not inherently dull, but the mechanistic treatment of these matters in many of the studies goes far to make it so. The fault may lie primarily in a failure of the investigator to determine exactly what place his recommended program would occupy in the general program of language or English studies; that is, the exact purpose for having the children master the vocabulary materials. If the goal is simply to have children be able to perform well on a vocabulary test, then the present methods probably do a fairly reasonable job--though even then not as good a job as is possible. If the goal is the development of a sort of minimal skill in reading and writing, of which the learning of new words would certainly be a part, then many of the recommended experimental methods seem doomed to failure or at least, give no signs that progress is being made, since the testing devices are not clearly designed to reveal such an achievement. Most of the experiments and studies do not, as a matter of fact, reveal that the students have gained appreciably in writing ability--they don't test it, generally--and only some of them suggest, on the basis of objective and dubiously reliable tests, that the student's reading comprehension has been particularly improved over whatever improvement would have come about naturally through the person's maturing and being exposed to normal reading in his classes. If the ultimate goal is not simply the ability to take a test in vocabulary successfully, nor the more ambitious one of improving his reading and writing skills appreciably, but is the even more ambitious one of creating in the pupil the capacity to react with enthusiasm, sensitivity, and perception to all aspects of language, whether in literary, philosophical, sociological, or scientific materials--of making him or her, in other words, a literate and cultured and growing member of his society--then few, if any, of the studies suggest even primitive methods for attaining this goal. The experimenter must clearly define what the ultimate purpose of his experiment is to be: simply testing certain methods in the realization of minor goals, after which the materials

can be integrated into the realization of more ambitious and worthy ones; or initially testing whether certain approaches to the teaching of significant materials are likely to be successful. There is, it seems to the present investigators, a singular lack of imagination in the investigations, and more importantly, a lack of consideration for the place a method will occupy in an English or language program, and a lack of a notion of what an English or language program should be. Are the experimental methods to be used to make the present programs more effective, or are they to be used in a more ambitious and more interesting program that the experimenter visualizes? Is it not sometimes the responsibility of the investigator to conceive of an ideal program he would like to see operational, and then to devise a study that will show how certain parts of that program can effectively be taught? A program in which vocabulary acquisition is designed as an important part of a general humanistic study of language and communication, a part of a program which is attempting to instill in students a sensitivity to language of all kinds, will be quite a different thing from one designed to increase the vocabulary of a student so that he can write minimally well or not get lost too many times in reading through an average-length paragraph.

Suggestions and Recommendations

Most of the suggestions on the linguistic factors in vocabulary studies have been hinted at already in the previous section. It might be useful at this point, however, both to summarize and also to suggest a few specific directions that vocabulary teaching studies might follow:

(1) The studies must specify in what context the methods they explore would be used, or must describe in some detail the kinds of studies that the pupils were engaged in at the time of the experiment. Too many studies leave nebulous, or more often, unmentioned what else the pupil was doing with language study, with grammar, with the reading of poetry or stories or history or science, at the time the experiments were going on. These factors must certainly be taken into account in the final evaluation of the statistical evidence, or must be given so that the reader in search of a new and better method can appraise how such a recommended method is likely to work in his particular program.

(2) The fruits of modern linguistic research must be incorporated into the studies. While the value of past studies of language must be admitted, it is still true that modern investigations have revealed facts of language construction and facts of

semantics that cannot be ignored by investigators. The possibilities of using such devices as the semantic differential (as described by Osgood, Suci, and Tannenbaum²²), or of using the cloze technique for pedagogical as well as for testing purposes (as suggested by Carroll²³) must be explored more widely. The use of generative-transformational approaches, both for the study of morphological units and more particularly for the study of the place of the lexicon in the general study of grammar and language, must be approached, if still somewhat tentatively. And certainly, the study of words through the various approaches to semantic fields must be given serious consideration, as well as the investigations centered around the Whorf-Sapir hypothesis.²⁴ Also, the time has come to recognize that the "standard" language is perhaps not as standard as many would like to believe it is. A cursory perusal of Webster's Third New International Dictionary reveals that words have an enormous variety of meanings, and that not all meanings of all words have identical geographical or social distribution; while a reading of literature reveals that the way Faulkner uses language is quite different from the way Hemingway uses it, which in its turn is quite different from the way Katherine Ann Porter or E. E. Cummings, or T. S. Eliot uses it. If students are to gain any notion at all of the flexibility of language, the multiplicity of its uses, and the multitude of its levels, then the studies of modern dialect geographers and social linguists or anthropological linguists must be taken into account. The typical ethnocentrism of most textbook materials on language will ultimately have to be broken, and now seems to be as good a time as any.

²²C. E. Osgood, G. Suci and P. Tannenbaum, The Measurement of Meaning, (Urbana, Illinois: The University of Illinois Press, 1957).

²³John Carroll, "Psycholinguistics and the Teaching of English Composition," College Composition and Communication, 7, 1956, 188-93.

²⁴Harry Hoijer (editor), Language in Culture, (Chicago: 1954).

(3) Investigators should look more closely at the techniques of foreign language teachers and teachers of English as a second language.²⁵ The teachers in these areas have already incorporated many of the discoveries of modern linguistics into their approaches with considerable success, and while it is true enough that teaching a native speaker more about his own language and teaching a non-native speaker a language are not the same processes, they do have much in common and there could conceivably be much cross-fertilization between the teachers of English and the teachers of foreign languages. It is especially important that teachers of underprivileged children familiarize themselves with these techniques and that investigators explore by experimental studies various promising approaches.

(4) The very subject matter of vocabulary study must be examined more closely. Commonly, words are not defined but are simply listed, so that many different structures are all subsumed under the same term. "Word" may be too vague a term for systematic pedagogical investigation, and we may need to devise, as Hockett has, other terms such as lexeme and idiom for certain constructions.²⁶ And even if this sort of thing is not done, or ultimately proves unnecessary, there must be an expansion of the kinds of "words" studied in vocabulary lessons. Presently nearly all studies confine themselves to the four major categories: noun, verb, adjective, adverb (defined traditionally, of course, which is itself a problem). Unusual pronominal forms such as whichever and whosoever conjunctive elements such as consequently, nevertheless, subsequently, and a priori, as well as numerous other "function words," are unduly neglected. A young pupil is no more likely to have subsequently in his vocabulary than he is to have adverse, and he must be taught or shown how to use and interpret such words. As a matter of fact, the teaching of certain transitional, conjunctive, and referential words and phrases might prove to be even more beneficial than the elaborate teaching of the major form classes. Certainly there should be experimental studies on the teaching of such forms and the various relationships that the teaching and learning of these units might have to the teaching and learning of the major classes.

²⁵ See, for example, Robert Lado, Linguistics Across Culture.

²⁶ Hockett, op. cit., Chapter 19.

(5) There probably need to be more careful studies of the applicability of certain techniques of teaching vocabulary to students at different grade levels. If Brown, Berko, Werner and Kaplan, and others are right, the acquisition of language takes different forms at different ages, and there is a strong possibility that an approach that will work for an eighth or ninth grader will not work for a second or third grader. It may be, for example, that initially pupils need to be taught words basically in isolation, but at later stages in specific contexts. An eight-year-old may not yet utilize the structural properties of his language adequately for attaining ideas about the meanings and uses of new words, whereas a high-school student would probably have considerable sophistication in such matters. All of this, at least, deserves consideration and exploration.

Generally, then, most present experimental studies and explorations are unsatisfactory in their treatment of language; the grammar and semantics on which the experiments are based are old-fashioned and shaky; the investigations and discoveries of students on the acquisition of language are not consistently taken account of; the subject matter itself is not carefully delimited or defined; the place of the experimental methods in specific programs is not clarified; and the ultimate goals of the teaching of vocabulary are not commonly elaborated (or even mentioned). It is not that many methods have not been tried, using minimally acceptable linguistic materials and resulting in suggestive and promising applications. There have been some few such reasonable studies, and there promise to be more. To the present investigators, however, there seems to be a serious disregard of contemporary explorations of language--so much so, in fact, that nearly all existing studies are partially invalidated, or when not invalidated, highly unreliable.

RESEARCH DESIGN FOR VOCABULARY STUDIES

Some of the problems facing the researcher in any area of investigation include designing a study which can be executed, controlling the variables not being studied sufficiently to make the results meaningful, analyzing the results in an adequate fashion, and reporting them in such a way that a reader will attain a clear picture of the procedure and conclusions. In reviewing the vocabulary studies, the present investigators found a wide range of practices in research design and methods of reporting. For that reason this chapter is devoted to suggestions for designing vocabulary research. The suggestions are based on a composite of the observed strengths and deficiencies in the reports of studies examined.

It is to be expected that some readers will find the suggestions extremely elementary; others will find them largely a review of principles already known. It is hoped that for still others this chapter will provide additional knowledge of factors to be considered when planning a study in the area of teaching vocabulary.

Hypothesis and Definition of Terms

In designing a vocabulary study it is essential that one define carefully the area in which vocabulary is being studied; listening, speaking, reading, or writing. Within the particular area the function of the vocabulary being acquired needs to be specifically delineated: Is the child learning a sight vocabulary via flash cards? Must he define the words via synonyms in a multiple-choice test? Is he learning to use the words in context? Is he learning exactness of meaning? Is he learning to build words from parts? Is he being asked to recognize a word or to reproduce it?

A clearly stated hypothesis should reflect the specific variables being explored and a definition of terms should provide the major limits of the study. For example, one has a fairly

clear idea of the researcher's problem when he states that he is testing the hypothesis that "there will be no statistically significant difference in improvement in words recognized on a 48-word list between a group of first grade children receiving automated instruction and one receiving non-automated instruction on (a) immediate posttest minus pretest scores, (b) twenty-four day posttest minus pretest scores."¹ Suppose, however, that the same researcher states his hypothesis as "there will be no difference in the effectiveness of teaching vocabulary by automated instruction and that of teaching by non-automated instruction." In this case, the reader is left to his own free associations regarding the variables being tested. What is meant by effectiveness of teaching? Is it not the learner's performance that is being measured? What facet of vocabulary of the learner is being measured? How is it being measured? The first hypothesis states that the sight recognition of a 48-word list is being measured on a pretest and a posttest and that the comparison between groups is being made of the changes in the scores. A shorter version of the hypothesis might state that "there will be no statistically significant difference in improvement in sight vocabulary between a group of first grade children receiving automated instruction and one receiving non-automated instruction," and be followed by a definition of the term improvement in sight vocabulary along with an identification of the measuring instrument and its use. In any case, the investigator would need to define clearly the terms automated and non-automated, being quite specific, since automation includes many variations. In this instance non-automation also poses a problem if the investigator chooses the broad definition of the term. The reader is again left to free association and may envision countless methods of teaching being employed. Such is the case when a researcher compares a particular method with the "traditional" methods or the "most commonly used" techniques. Any conclusive study demands a clear definition of what techniques are being compared.

In addition to definitions, some terms such as "words taught in phrases" need examples to demonstrate the type of material being used. Unusual phrases may be as foreign to the child as a set of nonsense syllables, even obscuring the meaning of the individual words within the phrase. The reader needs to be apprised of the type of material included within such a category.

¹James R. Wilson, "A Comparison of the Effectiveness of Automated Adjunct Autoinstructional, and Non-Automated Procedures for Teaching Sight Word Recognition to First Grade Pupils," unpublished Ph.D. dissertation, University of Alabama, 1964.

Isolation of Variables Being Studied

A clear definition of the variables being studied is but a first step in the process of research design. Delimiting and isolating those variables so that the reader has an understanding of the factors under investigation are crucial elements to the further application of the conclusions of the research. For example, to talk about learning sight vocabulary without explaining which sight vocabulary may lead to generalizations that are not at all appropriate in terms of the actual study. Sight vocabulary learned from flash cards may be different from sight vocabulary learned in context of other words or in a story. Or at least the skills used to identify the word may be different. Some studies have sight vocabulary learned under more than one condition; e.g., in isolation on flash cards without pictures and in phrases on flash cards without pictures. The children are then tested on their ability to read different material, perhaps a story, containing the words learned. It is important that the reader be informed of any accompanying "enrichment" exercises or other activities in which the children participated during the experiment. For instance, if the flash card contains a picture, the reader should be told so. It is possible that the effect of a picture demonstrating a single word might be different from one demonstrating a phrase or a sentence. The picture, rather than the word combinations, might be the variable producing the difference, if any, in results. Certainly many teachers can attest to the child's use of story illustrations as aids in reading certain passages. Again, definitions or explanations of words in isolation may be different from those given when the words are taught in phrases or sentences. Such differences need to be explicitly pointed out for the reader, while the experimenter needs to examine his material to determine whether or not his stated hypothesis contains the principal variables influencing the results.

Not only is the delimiting factor necessary for the reader's information, but the investigator should be aware that his method of presentation and testing may be so limiting that there is little general value in the results obtained. For example, sight vocabulary learned on flash cards and tested on flash cards may not represent what the pupil can do when he is required to recognize the words in competition with other words in a story. Cues which operate when the word is seen in isolation may be of little value when used in situations where there are interfering stimuli.

Another factor inhibiting the isolation of the variables being studied is the effect of the change of task for the students. If the study involves a routine different from the usual classroom

procedure or a person different from the usual teacher, the Hawthorne effect may contaminate the results. For example, with younger children the use of automated devices is likely to be especially motivating when first introduced. The investigator needs to be aware of these interfering elements and compensate for them either by conducting the experiment for a sufficiently long period of time to minimize the effect of such factors or by providing other means of controlling them.

Occasionally the material to be learned interferes with the isolation of the variables being studied. Many investigators choose word lists provided by published materials for a particular age group; others choose their own words. When the word list is deliberately chosen in a particular manner, such as "words of high interest," and the basis for word choice is not one of the variables being studied, it is difficult to generalize about other types of words. For instance, when the word list includes only words from the immediate environment or words in the speaking vocabulary of the children or words from the stories being read, the study may fail to demonstrate the effect of the method apart from a particular type of vocabulary. In choosing words listed as difficult, a further distinction needs to be drawn between useful difficult words and esoteric difficult words. The lists themselves may have a quality which facilitates or inhibits learning quite apart from other factors.

Measuring Instruments

Closely related to the material to be learned are the measuring instruments used to gauge learning.

Not only must the researcher check the reliability of his instruments, but it is essential that there be some measure of predictive validity if the instruments used are to furnish data which actually predict future performance. When a standardized vocabulary or reading test is given, the investigator may be inclined to accept the instrument without examining its content critically or without studying the manual sufficiently to note the limitations of the sampling, the date of the standardization, or the basis for choosing the words included.

Further, there is danger of making such assumptions as that "ability to recognize synonyms in a multiple-choice test is the same as the ability to use the word in context or to explain its meaning or to understand a sentence when the word is used." Or one might ask whether or not a test requiring definitions of prefixes actually tests the ability to use these prefixes in a meaningful fashion.

When the researcher constructs his own instruments, other problems arise. Some researchers test the measuring instrument for reliability by running a pilot study or by using a different group under non-experimental conditions for constructing the instrument. Other investigators do not use any such check on their measuring devices.

Another factor that needs to be considered concerns the possibility that the measuring instrument used for testing the difference between two groups favors one group over the other. In comparing programmed instruction with non-programmed instruction, for example, a test written by the programmer may favor the programmed group. In comparing groups which have learned words in context with a group which has learned words in isolation, a story may favor the context group. A less biased instrument might contain sections incorporating both types of material learned.

An additional facet which may operate to introduce interference in the testing situation is exemplified in a study comparing the learning of new words in phrases and the learning of words in isolation. Some of the phrases learned not only contained more than one new word, which may have produced an interference of stimuli, but the testing instrument did not use the same phrases as those learned. On examination it appears that the testing instrument favored the group learning words in isolation. Had familiar phrases been learned and the phrases involved only one new word at a time, the reader would have less basis for posing the hypothesis that the phrase, not the words, was being learned. In order to cover that possibility the story used as the measuring instrument should have contained at least a definite portion which included the phrases learned.

The sensory medium used for testing may also influence the results. For instance, if the study compares the growth of vocabulary comprehension in listening and in silent reading, a test which is read silently favors the reading group, particularly if a similar passage is used or if it is one containing many of the words read. There is strong evidence that the two vocabularies, reading and listening, are not the same. A more meaningful test in this situation would test growth in both listening comprehension and in reading comprehension; or if reading vocabulary is the sole interest of the investigator, a test which minimizes the effect of practice would need to be used since reading the word in a specific context may provide cues which would assist a person taking a silent reading test covering the same material as that in the learning passage but which would not necessarily transfer to other material.

Another caution which some investigators have overlooked is the requirement of a pretest on the final criterion measure. Posttests tell little without the knowledge provided by a pretest. Some control also has to be exercised here over the practice effects. In tests using context to supply word comprehension, it is often possible to find or construct similar passages. With standardized tests or other published materials parallel forms may be available. But with researcher-constructed material, there is often a lack of carefully constructed parallel forms. If the time interval for the experiment is short, the memory effect or motivation to learn the unknown words on the pretest may contaminate the posttest scores. In one study, for example, the control group, after the criterion test, learned enough of the test words during the interval between the first posttest and the second one to erase the statistically significant difference between their scores and those of the experimental groups. It seems elementary to point out that comparison between groups should be made on change in scores rather than on posttest scores; yet several studies compared only posttest scores without reference to change in scores.

Two very difficult areas to measure are those of attitude and of interest. A few studies attempted to compare groups with different attitudes or with special interests. When a researcher defines a group on the basis of one of these factors, it is highly likely that a strong element of subjective judgment enters the picture. Measuring instruments in this area are woefully weak and may reflect factors which the researcher has not anticipated. Statements from the students apart from tests may not be valid either. Whether words identified by students as related to their interests actually reflect the students' interests or reflect what they believe the teacher wants them to indicate as "interest" words may make the difference in the results of a study designed to test the effect of differences in use of special word lists. A researcher compiling such a list may find that listening to his subjects talk or observing the vocabulary used on their favorite TV programs produces a more valid and reliable "interest" word list than does one based on their reading material or the interests they choose to report to the adult inquisitor.

Sample Population

No matter how adequate the measurement device, an inadequate sample of the population being studied can invalidate the results of the study for predictive purposes.

Some very obvious characteristics of the sample which need special consideration include age, sex, socio-economic background, verbal ability, and educational level of the group. Several of the

most interesting studies were conducted with college classes. Although studies of such populations provide a basis for further research on other populations, the methods found to be successful in a college group may not be at all successful in the average public school classroom. Even within the college population certain groups appear to be over-represented in the studies--psychology classes, for instance. The type of vocabulary taught in the experiments also appears to be limited. For example, there is a scarcity of studies involving special vocabularies such as those found in science or various technical fields. In addition to representing a group with a restricted range of educational background and academic ability, the college sample is likely to be motivated by goals quite dissimilar to those of the average secondary and elementary student. Their vocabulary needs are also different, in many cases, since the tasks required of them demand a greater level of abstraction and discrimination.

Developmental studies of children indicate that the vocabulary of the average or above average child increases as a function of age, quite apart from any formal attempt to develop vocabulary. It is apparent, then, that results of studies which are valid for six year olds may not be at all valid for twelve year olds. Piaget's stages of concept formation suggest that experience as well as age is a factor in the learning of concepts, that a child who despite his age has not had the opportunity to conceptualize on a certain level may be hampered at a more advanced stage. It is essential, then that the researcher identify certain background features of the population used, such as general cultural background of the group, general educational level of parents, urban-rural elements, and other experiential factors that might enhance or limit the child's vocabulary growth.

One group of children which is easily accessible to many doctoral candidates and is frequently sampled for vocabulary studies is the university demonstration school population. Not only is such a group unlikely to be typical of the average classroom group, but the experiences provided and facilities available are not those generally accessible to the average child. In addition, these children, if frequently exposed to experimental situations, may be more amenable to instructional change than the average pupil and may show greater improvement under experimental conditions than under control conditions.

Sex is another factor that may affect vocabulary growth and needs to be considered when equating groups. Most research studies in the area of language development attempt to control this variable

by assigning a similar ratio of boys and girls to the control group and to the experimental groups. Whether or not the composition of a group so established that it contains a disproportionately large number of one sex stimulates or inhibits vocabulary development in the entire group remains unanswered at the present time. Recommendations for a research design would include, however, the suggestion that groups under different treatments not only contain similar ratios of boys and girls, but that, until other evidence is available, they also be formed so that there is not a greatly disproportionate number of one sex.

Bilingualism, if present in more than a small percentage of the group, needs to be specified and groups equated on this variable unless the study itself is concerned with the effects of bilingualism on vocabulary growth. In certain areas of the United States this factor may present special problems to the child trying to learn English. The reader needs to be apprised of the extent to which this feature was present in the sample under investigation.

In attempting to equate groups, the researcher should concern himself not only with total I.Q. but also with verbal I.Q. As long as chronological age is held fairly constant, the I.Q. may be a sufficient measure; but if the study involves a range of chronological ages such as some of the studies on children in special education or those made to test the effect of mental age on learning an initial sight vocabulary, the mental ages need to be reported also. Again, the reporting of I.Q. or mental age is a function of the hypothesis. If there is an attempt to show that one method produces better results with a certain mental age group than with another regardless of I.Q., then mental age would be the basis for equating groups. But in most studies the I.Q. is an appropriate variable for matching groups, with verbal I.Q. being checked also.

There appeared among the studies reviewed a variety of techniques for matching groups. One of the more common practices was the matching of part of a class with the same number of students in another class. In such cases the extreme scorers were omitted. The present investigators felt compelled to question this practice. In most of the cases no reference was made to the characteristics or to the size of the total group. Any experienced teacher can attest to the interaction which may be stimulated by a few very intelligent children. Therefore, a class containing such children may have a built-in motivational device which makes the group function differently from another class without such children. It is obvious that other personality factors of some students also act to create different climates in the classroom; but since measures of these traits are

not easily obtained, control of these variables is not usually attempted. However, since I.Q. is a measure which can be obtained and is usually a basis for equating groups, it appears essential that the total groups be equated on that variable instead of fifteen or twenty members of one class being equated with a similar number in another class.

Analysis of covariance is sometimes used to take care of the lack of comparability of groups on a particular variable. Although the statistical techniques are sound, this additional element of interaction or stimulation produced by highly intelligent children or what may be a depressant effect of several pupils with particularly low intelligence does not show up in such comparisons. The present investigators would recommend that the total groups be equated for general intelligence, and for certain vocabulary skills. Depending upon the hypothesis being tested, a reading readiness test or a test measuring reading comprehension might also be a basis for establishing comparability. Both group means and standard deviations should be tested for significant differences. Some measure of comparability on the specific task under consideration also needs to be made. For instance, a particular word list to be learned should be equally unfamiliar to all groups involved in the study.

The need for a control group cannot be over emphasized. There is considerable evidence that a child's vocabulary increases merely as a function of living in a social environment. To offset this factor of vocabulary increase through growing older, the researcher should provide a control group which has no special vocabulary instruction or, if this arrangement is not feasible, one which is being taught by a carefully described "conventional" program.

Two final factors worthy of mention are the size of the sample and the method for choosing it. Needless to say, a group of fifteen or twenty students is not large enough for any conclusive results although a carefully selected sample of such size can surely raise pertinent questions and suggest tendencies which need further exploration. What constitutes a large enough sample depends upon many factors and in most cases an experiment would need replication before one would be justified in making major policy changes on the bases of the results. In addition, the method for choosing the sample is a particularly pertinent variable when considering the quantity to be used. A small sample which is truly representative may yield more valid results than one which is highly select. Random sampling is a desirable method for selection when feasible, but in many school settings it is not possible to use this method.

At best, the sample needs to be as representative as possible, with both experimental and control groups equated on the variables which may influence the variables being studied. And a description of the population with its limitations should be included in any account of the results.

Other Variables

Even with an ideal sample available, certain other variables may create doubts about the results of a study.

The length of time of the special treatment seems to be an important variable. Many of the experiments extended no longer than six weeks; some of them ran for only six or ten days. A method of instruction recommended for classroom use needs to be tried over a considerably longer period of time than two weeks. The Hawthorne effect, the initial curiosity which often accompanies a new approach, the challenge to "beat the game"--all may contribute to an increased motivation on the part of the individuals in the group. The initial approach may also stimulate the use of certain skills that have not been used recently and neglect the reinforcement of others. These differential effects might not become apparent in a short period of time.

One method may also be more effective than another after an initial consolidation period. In some cases a statistically significant difference might not appear for an entire semester or a year, yet rapid growth may take place after the initial foundation is laid. For this reason there need to be more longitudinal studies of vocabulary teaching than presently exist. Recommendations based on the results of a study extending over a few weeks can only be suggestive and should be so labeled by the investigator.

Another factor related to time is the use of delayed posttests. Surely retention is as important an objective of teaching as is efficiency of acquisition, yet only a few of the studies administered delayed posttests. A particularly valuable design is one in which one group continues to use an experimental technique while another group (which has used it) discontinues its use. A comparison of the two groups after a period of time and a further comparison with a control group which has not been exposed to the technique should give at least some measure of retention as well as a measure of acquisition.

Another variable related to time concerns the differential amount of practice available under the techniques being compared. Often results which indicate no statistically significant difference between two methods will yield significant differences when the time factor is held constant. Many of the studies reviewed did not indicate whether or not all groups were spending the same amount of time on the material being taught. Yet, if time is not one of the variables being studied, the researcher needs to equate his groups on that variable or explain to the reader why such control was not exercised.

A similar factor related to vocabulary growth is the reinforcement from other language activities for the material learned under the experimental conditions. Many of the studies report only the activities during the ten minutes or more devoted to vocabulary development. Yet most language programs integrate such instruction into a larger frame. These unreported activities could well be the important factor which produced the results, even when all groups received the same unreported treatment. Also, certain techniques complement each other while others may create interference patterns. A well-designed study should include a description of the total language program being pursued during the time of the study.

A few of the studies attempted to have one group act as its own control by having the group work under first one method and then under the other. Often the total group is divided into two sections, one receiving one of the treatments first, and the other group receiving the other treatment. When half the experimental period is completed, the treatment groups are reversed. The researcher has then not only used the group as its own control but has also controlled the order of treatment given. However, this method has certain limitations. Since the time for the experiment is generally too short for very conclusive results, this use of two methods for the same group cuts the time even shorter. For instance, if one method demands a higher level of skill than another, there is even less time for the more complex skill to be developed. The results may favor the easier task because of the shortened period for comparing its effectiveness with the effectiveness of a more difficult task. Also, if one task, such as learning words in phrases, involves a skill more complex than the other task, which might be some skill such as learning words in isolation, the use of both methods for two short periods of a few weeks each may produce interfering sets which inhibit the operation of the more complex task. If the researcher chooses to follow this procedure of using one group as its own control, then surely he must allow a

sufficient length of time for the consolidation of the skills needed for each task and strive to minimize the inhibitory effects one method may exercise on the other.

Another variable which has been mentioned slightly in an earlier section is the type of words being used. For older students, especially, attitudes toward certain types of words may act as interfering stimuli when these words are presented. Technical terms, mathematical vocabulary, and other specialized language that is not the usual terminology encountered in a day's reading or listening may meet with resistance from the adolescent who has decided he "cannot learn these words." Unless the hypothesis includes the study of these special vocabularies as one of the variables, then it seems unwise to include a list of these words "just to make certain that the words are not familiar to the members of the groups."

Two final variables which deserve specific mention are teacher bias and teacher effectiveness. Most students who have experienced several years of schooling are aware of the effect of teacher enthusiasm. A teacher who is enthusiastic and positive when using a certain method will transmit some of this feeling to at least a portion of his students, while a teacher who has strong negative feelings toward a method is likely to transmit some of these feelings also. When only one or two teachers are used in a study, the effect of teacher bias may be the determining factor in the outcome of the study. Even with a large number of teachers, a new method which is strange and quite different from any previous method used by the teachers may generate enough negative--or positive --feeling to influence the results; e.g., some of the methods employing several mechanical devices or a method using programmed instruction or a method employing a new alphabet.

Teacher effectiveness is a variable that is extremely difficult to measure, and at best the evaluation contains a highly subjective quality. The number of years of teaching experience is not a guarantee that one teacher is more effective than another, but this type of data should be reported by the researcher. If possible, at least an administrative rating of teachers' effectiveness needs to be used to equate teachers operating under experimental conditions. It is highly inappropriate to use only those teachers identified as the best ones for the experimental conditions and to use unclassified teachers for control conditions. Use of the same teachers for both conditions has several points in its favor since each teacher can act as his own control, but unless several teachers are used, teacher bias toward one method may be a potent influence on the results.

Many other variables impinge upon the results of the study, and it is a rare design that can control all of the important factors. This discussion has merely been intended to emphasize some of the more obvious ones.

Analyzing the Data and Reporting the Results

A further comment needs to be added regarding the analysis of data and the reporting of results. Many of the more recent studies employed some statistical analysis of the data. The most common tools noted were the test for significance of difference between means, the analysis of variance, and the covariance technique. It is important, of course, to read an elementary statistics book sufficiently to grasp not only the techniques for statistical analysis but also the limitations of the techniques, particularly when used with non-normal distributions. Use of some of the non-parametric techniques such as chi-square is feasible with certain types of the studies reported.

The means, standard deviations, critical ratios, and F-ratios should be reported as well as the statistically significant differences. A consistent tendency which almost reaches .05 level of significance may well indicate an important finding demanding further research under more carefully controlled conditions.

As for the over-all reporting of the research itself, the authors of the studies followed a wide range of practices. With some of them there seemed to be little or no relation between the original hypothesis and the reported conclusions. In some of the studies it was extremely difficult to identify the hypothesis. A report of research that is to be of any value, other than that of satisfying the requirement for some degree, should follow a logical sequence and at least accept or reject the hypothesis or indicate why the data could not do either. To start off with the hypothesis that "children learning vocabulary by using word parts will learn a vocabulary list more quickly than children learning whole words" and then to ignore this hypothesis in the conclusion and substitute the conclusion that "children learn more quickly in groups than when working alone" is a disservice to the reader. Surely, the latter conclusion is worth mentioning, even though this arrangement was not a deliberate part of the original design; but the readers, if their curiosity is at all aroused, want to know what the data showed about the difference between the groups operating under the conditions relating to the hypothesis.

Conclusion

A concluding statement must re-emphasize the fact that this chapter was not meant to represent an exhaustive elaboration on research design. The present investigators felt compelled, after reading the numerous studies on vocabulary, to summarize some of the principles which seemed to add strength or weakness to particular studies. One final suggestion comes not only from the feeling that is there a need for more carefully designed studies but also from the belief that there is a need for researchers to venture into new kinds of studies. For example, what correlations exist between the rate of learning a reading vocabulary and the rate of learning a listening vocabulary? What effect does teaching vocabulary in one sense modality have on the vocabulary development in another modality; e.g., listening and speaking? What happens to learning rate when sense modalities are combined? Exploratory studies in these areas might suggest some very profitable and interesting possibilities for further studies.

VI

SUMMARY AND RECOMMENDATIONS

There was some feeling on the part of the writers of this report that it should conclude with the preceding section and not follow the thesis-engrained tradition of a recapitulation and final word. Perhaps this reluctance was due to a hesitancy to say outright that the teaching profession seems to know little of substance about the teaching of vocabulary. That we do know very little is the feeling of the present investigators, however, and should, in good conscience and because of the assignment, be said.

Certainly the studies on teaching vocabulary have shown that some teaching effort causes students to learn vocabulary more successfully than does no teaching effort, that any attention to vocabulary development is better than none. The studies examined in this investigation have not shown, though, that a particular method is better than any other--at least not to the satisfaction of the present investigators. The evidence that appears to have been accumulated favoring the teaching of words in isolation over doing so in context, for example, is regarded as something of a fluke, related to the measuring instruments and the inadequacies of the context used in the comparison. Similar impressions are held concerning the evidence regarding other methods, techniques, and variations in approaches to the problem.

More on the positive side, as far as an accumulation of evidence about what is known about vocabulary teaching is concerned, is the dispelling of the widely-held notion that having students "read, read, read" is a satisfactory method for teaching vocabulary. While fault can readily be found with measuring vocabulary growth resulting from a program of extensive reading in the same manner as with measuring growth from a direct vocabulary teaching campaign, the evidence does support the idea that greater vocabulary growth would result from such reading if a planned vocabulary teaching effort were related to it. This, of course, is again saying that some attention to vocabulary teaching is better than no attention.

A major flaw in most studies examined, as far as the title of this investigation is concerned, and one that has been alluded to previously, was the lack of specificity as to the part a particular method or procedure played in a study. The studies simply did not satisfactorily compare methods. The present investigators add, however, that possibly such comparisons shall continue to be absent from the research scene, not because methods could not be detailed specifically, but because the skills needed for learning from the application of different methods may well be so different, so lacking in similarity, even, that they are not comparable. These skills, too, may be learned and held with varying degrees of success by different individuals due to many, as yet unexplored, factors.

Recommendations

The decision of the investigators to limit this examination to studies dealing as directly as possible with pedagogical matters, with the teaching of vocabulary as opposed to those, for example, concerned with how an individual acquires his native vocabulary, how vocabulary is best taught in a second language, and psychological factors affecting vocabulary learning, seemed necessary because of time limitations and the nature of the assignment by the National Council of Teachers of English, though possibly this decision resulted in the failure to examine research seemingly tangential but perhaps quite pertinent to vocabulary teaching. Certainly the research on perception and its relationship to language learning, with specific application to vocabulary, needs to be examined. Too, knowledge of environmental conditions of import to various types of learning undoubtedly bears upon vocabulary acquisition. In fact, much psychological research, which tends to be of a "pure" research type, has relevance to vocabulary teaching though the nature and width of the gap between it and classroom application needs examination and reporting. Perhaps the relatively new discipline of psycholinguistics may accomplish this. It is recommended by the present investigators that future researchers in vocabulary teaching look to psycholinguistics for clues as to methodology which may be examined.

It is recommended also that foreign language teaching and studies concerned with such teaching be examined for useful suggestions to vocabulary teaching.

The investigation of the most satisfactory methods for teaching vocabulary appears to remain a rather "wide open" area of research.

Many questions which seem fundamental to vocabulary teaching apparently remain untouched. Particularly is this true in light of our present knowledge of language and of research design and the ability which we surely must possess for properly implementing investigations based upon such knowledge. This report concludes, therefore, with a list of questions, each of which might become the nucleus of a research study, and each of which should be answered if the profession is to adequately teach vocabulary:

1. Are certain vocabulary teaching procedures or methods more appropriate for some age groups than others? Which procedures are appropriate for specific groups?
2. Should different methods be used for different subcultural groups? What cultural factors prompt a need for different teaching procedures?
3. How should teaching procedures differ for different intellectual levels? For different motivational backgrounds of students?
4. What would be the effect of a long-term humanistic approach to vocabulary teaching compared to a skills approach over a similar period of time?
5. Would longitudinal studies show different results from those shown in the relatively short term studies which have been conducted?
6. What would be the effects from vocabulary teaching in all areas of the curriculum as compared with that done typically only in the English or reading class? Would a concentrated effort by a school, regardless generally of the specific method used, result in great vocabulary growth by pupils?
7. Are there some aspects of vocabulary knowledge that must be learned in isolation rather than in context? Conversely, is there some vocabulary that can only be effectively learned from a contextual presentation?
8. What are the effects of the environmental conditions of a word (e.g., its physical position in relation to other words) upon the effectiveness of using a context method for vocabulary teaching?
9. Are there certain contexts which make vocabulary teaching more successful than others? Are there contexts which facilitate the remembering of words learned?
10. Are there emotional blocks to learning vocabulary which result from particular teaching procedures or materials?

11. Can tests be devised which measure wider application of word knowledge than those now used?

12. What effects would result from various procedures for teaching vocabulary if particular teaching sequences were followed? For example, would the several procedures be equally effective if one-morpheme words were taught first, then compounds, then derivational suffixes, and so forth?

13. What is the effect of purposes or goals for vocabulary teaching upon the success of different methods? Are some methods more successful than others for particular purposes?

14. Are some words not subject to teaching in context because of the subject matter of the context?

15. Are there interfering words in some contexts? What is the effect of teaching a word in a phrase or a longer context if not all of the other words are equally well known?

16. What are the effects of teaching vocabulary in one sensory medium upon vocabulary learning in others? For example, what is the effect of teaching a reading vocabulary upon vocabulary growth in writing? Could some slight extension or modification in method result in greater transfer?

17. Can vocabulary teaching directed at teaching words labeled as informal or colloquial be done more successfully than that directed at teaching those regarded as formal?

18. What would be the effects of particular teaching approaches upon the learning of words with inflectional suffixes as compared with their effects upon the teaching of words with derivational suffixes, for example? Or of those with "living" affixes as opposed to those with "dead" ones?

19. What would be the results from "context teaching" of vocabulary if the grammatical and semantic features of the language were clearly explicated and consistently utilized?

20. What would be the effects of different methods of teaching vocabulary upon its learning for use in different media? Are procedures which work well for teaching vocabulary for reading those that should be used for teaching vocabulary for speaking, writing, and listening?

21. Should the same methods be used in teaching vocabulary for the purpose of gaining minimal skill in reading as for reading with sensitivity and perception to language, reading with greater comprehension, etc.?

22. What specific procedures used in the teaching of foreign languages could profitably be used for teaching English vocabulary?

23. What is the effect of classroom climate, particularly the rapport between teacher and pupils, upon the results of vocabulary teaching?

24. May some words, some individuals of particular ages, intellects, and subcultural categories and/or sizes of groups be taught more effectively by automated procedures than by conventional ones?

25. What are the effects of certain student personality and emotional factors upon the success of particular teaching methods? Also, are some materials more appropriate to use with some personality types than are others?

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